A State-of-the-Art Application of Computer Technology-Vending Computer Generated Games for Profit

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Stanley M. Levin
University of Central Florida

A STATE-OF-THE-ART APPLICATION OF COMPUTER TECHNOLOGY-

VENDING COMPUTER GENERATED GAMES FOR PROFIT

BY

STANLEY M. LEVIN
B.S., University of Miami, 1960

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ABSTRACT

The recent and rapid advances in micro electronics technology has resulted in the continued and dramatic reduction in the cost and size of logic circuits used in computers and computer interfaced devices. This technology now makes it possible to purchase a sophisticated computer system and multiple terminal devices for less than $60,000. The subject of this Research Report is to show the feasibility of applying this computer system, including 32 phone line interfaced video display terminals and a time sharing software package, to vend computer generated games for profit.

Approved by: _____
Director of Research Report

SECTION I

INTRODUCTION

The recent and rapid advances in micro electronics technology has resulted today in a dramatic reduction in the cost and size of logic circuits used in computers and computer interfaced devices. Some of these recent technological advances are evidenced by Large Scale Integrated (LSI) circuits which now allow an entire Central Processing Unit (CPU) of a 16-bit word computer to reside on a single, 15 inch square, printed circuit board. Using LSI manufacturing techniques, it is now possible to make a "chip", no bigger than a dime, containing over 4000 bi-stable multivibrator circuits (flip-flops). Thirty years ago, a single multivibrator circuit required two electronic tubes and was at least as large as two rolls of dimes. This represents a reduction in size of approximately 400,000 times.

This technology now makes it possible to purchase a computer system containing 65,536 characters of core storage, 262,144 characters of disk storage, and interfaced to thirty-two 300 baud telephone lines for less than $40,000. Also, an alphanumeric video display and input keyboard terminal can now be purchased in quantities of 32 for less than $600 each. [1]

The subject of this Research Report shall be to show the feasibility of combining this computer system with multiple video display terminals into a time sharing system to vend computer generated games for profit.

SECTION II

FUNCTIONAL DESCRIPTION

The computer generated game vending system uses a minicomputer that is connected via telephone lines to thirty-two (32) remotely located terminal units. A system functional block diagram is shown in Figure 1. Each remote terminal unit consists of a video display, a keyboard, a coin box, and the necessary electronics to communicate with the minicomputer over a telephone line.

A patron desiring to play a game may select one from a list of games that is being dynamically displayed on the Terminal Unit. He first deposits an appropriate coin in the coin box. This serves to activate the keyboard enabling logic in the Terminal Unit so he can select one of the games stored in the memory of the computer.

An example of the numerous games available for play on each of the terminals is a game called "Artillery". Upon the player depositing his coin and selecting this game by means of the keyboard, the computer causes the video display unit to give the distance to a hypothetical target that the patron is to destroy by selecting an appropriate aiming angle of an artillery piece.

The computer generates a target distance at random and the patron must decide the angle to which his artillery piece is to be elevated. Shortly thereafter, the computer tells him, by means of the video display unit, whether the round he fired fell short or went over

SYSTEM FUNCTIONAL BLOCK DIAGRAM

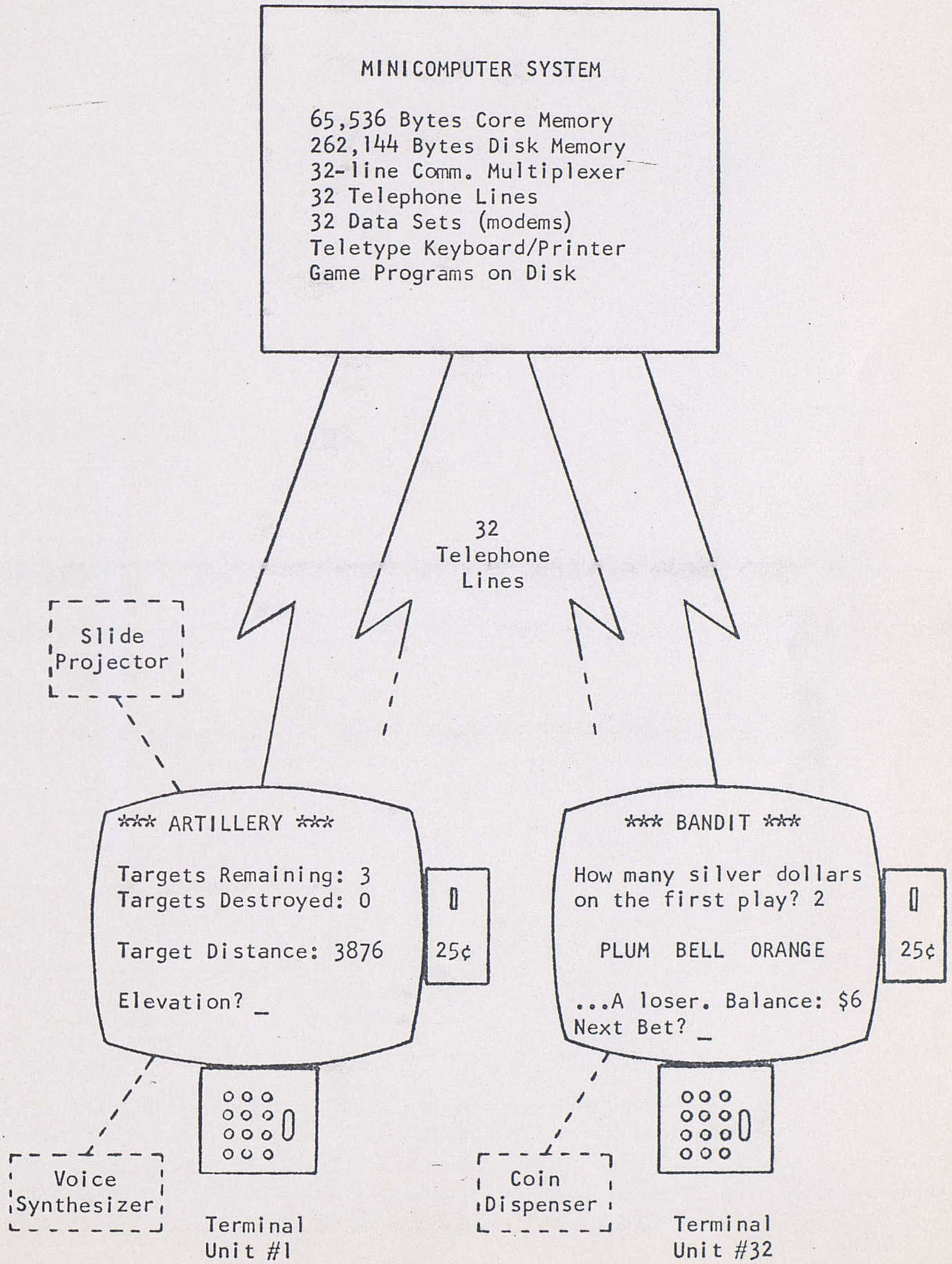


FIGURE 1

the target and by how many yards. It is then encumbent upon him to select a more appropriate angle for his artillery piece before firing the next round. Each time a round is fired, the computer "speaks" through the video display unit, informing the patron how good his aim was, including telling him if the target was destroyed. This will occur if the round lands within 100 yards of the target.

Some game vending systems may incorporate the use of an automatic change dispenser so the patron would receive a monetary return under certain conditions. As an example, if the patron can aim the artillary piece accurately enough so that the target is destroyed on the first round, he might receive a monetary return of twice the game cost. On the other hand, if it takes him more than one round to destroy the target, he would not receive any monetary return.

Additionally, some game vending systems may incorporate the use of a random access slide projector so that some form of commercial advertising may be presented on the Terminal Unit for added revenue.

The initial demonstrator system allows the following four (4) games to be played:

* Artillery
* Derby
* Bandit
* Artilleria (En Espanol)

Production models will have, as a minimum, the following additional games available for play on each Terminal Unit:

* Blackjack
* Craps
* Football

* Baseball
* Golf
* Tic-tac-toe
* Battleship
* Bingo
* Chess
* Roulette
* Moo
* S.C.P.**
* Star Trek

** PLAYBOY, December, 1969, pp.155-157.

SECTION III

SYSTEM DESCRIPTION

The central minicomputer system, as shown in the block diagram of Figure 2, contains the following major components:

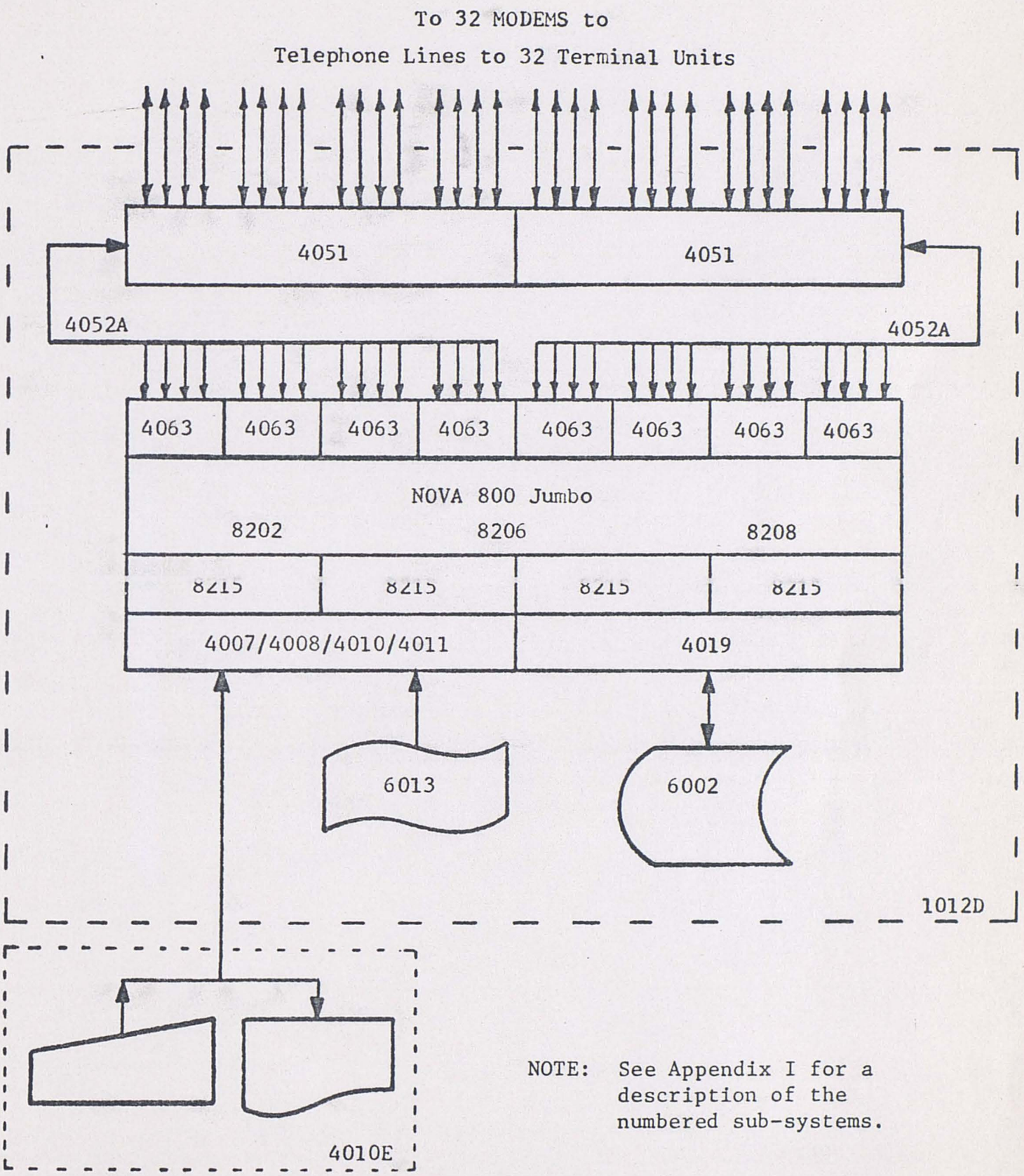
* Central Processing Unit (CPU)
* 65,536 Characters of Main (core) Memory
* 262,144 Characters of Mass (disk) Memory
* 32-line Communications Multiplexer
* 32 Data Sets (modems)
* 32 Telephone Lines
* Teletype Keyboard/Printer

A detailed system quotation, from a major minicomputer manufacturer, is shown in Appendix I. A similar system which includes a high speed paper tape reader and punch and a line printer is pictured in Figure 3.

The remote Terminal Units, as shown in the block diagram of Figure 4, contains the following major components:

* CRT and associated Electronics
* Data Set (modem)
* Power Supply
* Character Generation Logic
* Special Keyboard Control Logic
* Character Storage Registers (memory)

CENTRAL COMPUTER SYSTEMS BLOCK DIAGRAM



NOTE: See Appendix I for a description of the numbered sub-systems.

FIGURE 2

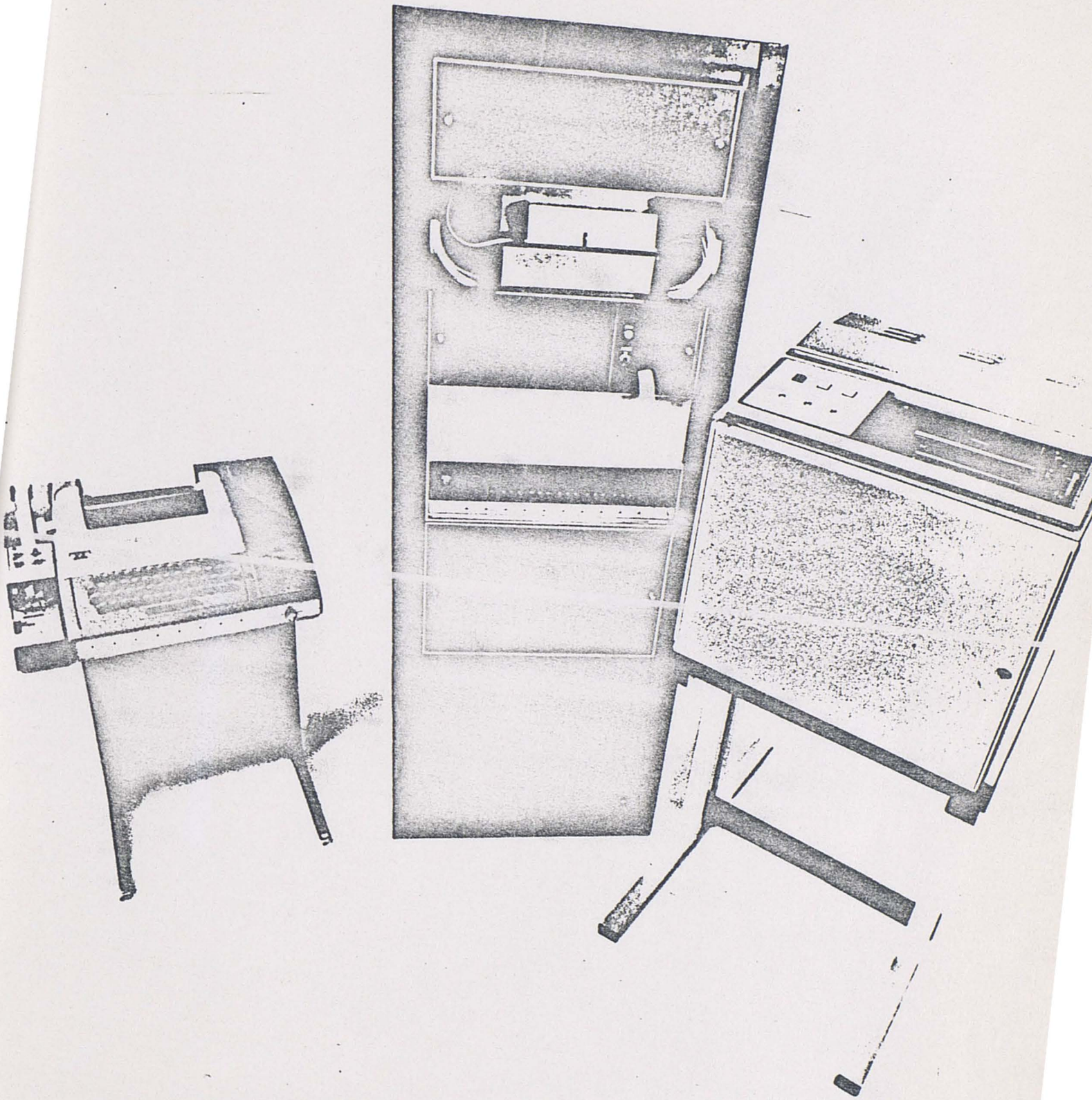


FIGURE 3

REMOTE TERMINAL UNIT BLOCK DIAGRAM

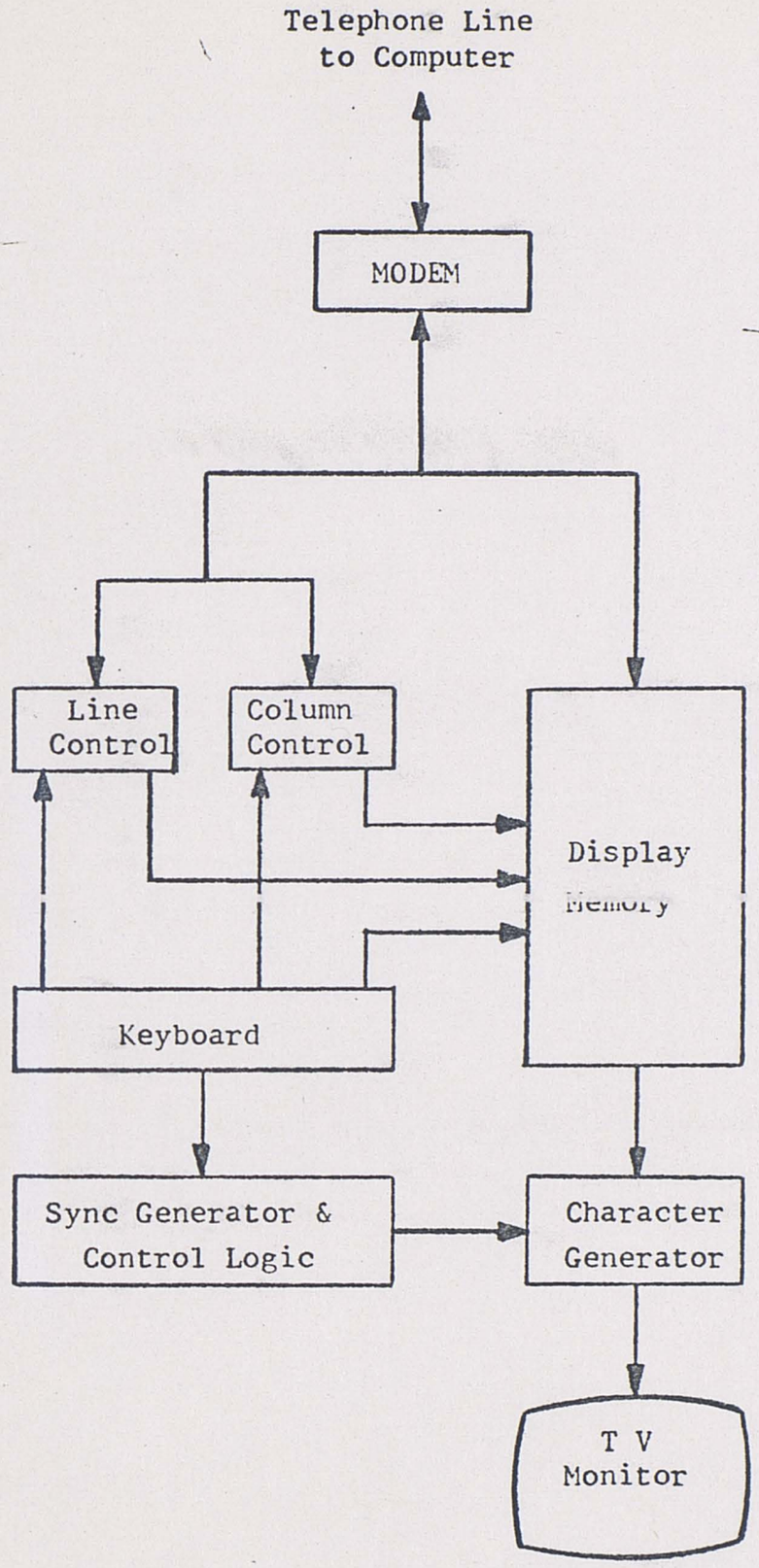


FIGURE 4

* Keyboard (13 Numeric & Function Keys)
* Coin Box & non-quarter Reject Unit
* Attractive Enclosure

A proposed Terminal Unit is pictured in Figure 5.

An essential ingredient for any portion of the system to operate is known as the "software". This consists of two main programs - A Time-Sharing Higher Order Language Program and A Real-Time Disk Operating System Program. The minicomputer vendor usually has these programs available. The game programs are presently written in a time-sharing interpretive language called BASIC.

PROPOSED REMOTE TERMINAL UNIT

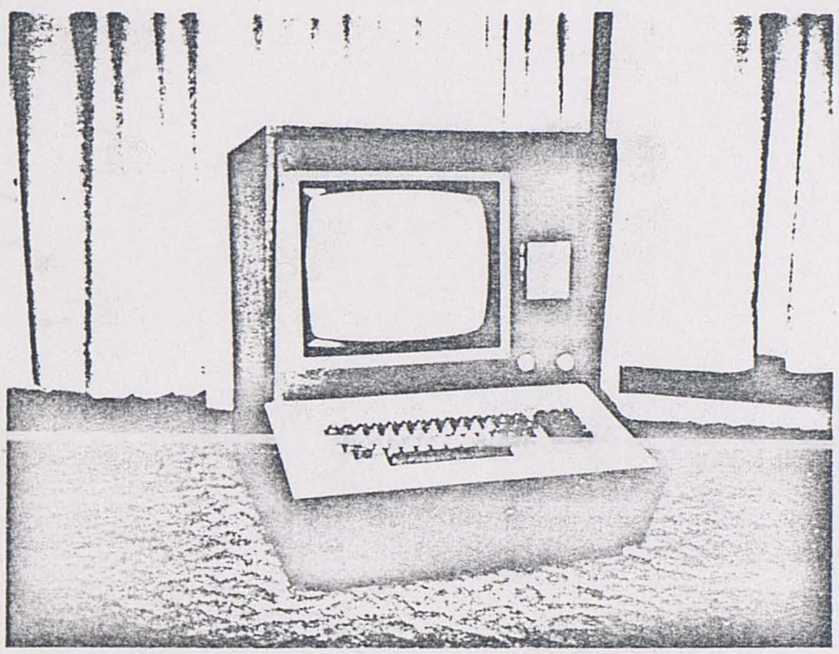


FIGURE 5

SECTION IV

HISTORICAL NOTES

The earliest record of unattended retailing of automatic merchandising took place over 2000 years ago. Some forward thinking entrepreneur in ancient Rome operated a public bath on the honor system. The customer would drop his "talent" into a wooden box by the entrance. Possibly the fact that the box also contained live snakes did away with the need for locks to prevent pilferage.

The first machine type dispensers appeared in Utah in the 1890's where either a divorce decree or marriage license could be obtained with a silver dollar.

Vending machines as such only came into their own in the 1930's when cigarette, candy and gum were first introduced. The real expansion began after World War II. The need for round-the-clock snack service in defense plants paved the way for rapid spread of "on-location" vending in factories, offices, schools, hospitals and so on.

The history of electro-mechanical game playing for money originated with the forerunner of the modern day pinball machine in 1931. This early machine, called the "Ballyhoo", after a satirical magazine of that day, provided seven-balls-for-a-penny and utilized a plunger to shoot a ball towards one of the several numbered-valued holes which were guarded by a series of bristling pins. Hence the name "pinball". After "Ballyhoo", other games were introduced,

gradually incorporating elaborate electric scoreboards, thumper bumpers, slingshot kickers, push-button flippers, and the incredible snarl of wires, relays, and solenoids that make up the internal workings of the modern pinball machine. [2]

Other games that are now quite popular are an electronic target shooting game, a "computer" I.Q. test game, an electro-mechanical baseball game, and a highway driving game.

Within the last year a new game has appeared in lounges across the country that seems to be very popular because of its colorful animation and simplicity. This is an electronic Dart Board game that consists of either a one or two piece display panel which is hung on a far wall and a button mounted in a box which the player holds. By lighting up different portions of the display panel which has painted on it, a male figure, female figure, and a dart board, an animated effect of the figures throwing the darts at the dart board is created. The object of the game is to first press the button and then release it as close to the actual time that the figure appears to release the dart. If the time difference is within certain limits a "bullseye" may be scored (usually 10 points). Releases earlier or later than this "window" result in progressively lower scores. Two people can play this game for 25¢ with the game ending when either player reaches a score of 90 points. The game takes about 5 minutes to play and grosses between $100 and $700 per month depending on the location. [3] Another form of this game uses golfing figures and a green. Since this game offers some apparent animation, is easily learned, and offers a competitive challenge against another player, it has been very successful.

Computers have been taught to play simple games like tic-tac-toe, and blackjack for a number of years. It has only been very recently that technology has brought the price of computer systems down to a level that makes it economically feasible to vend computer generated games for profit.

SECTION V

COMPETITIVE SYSTEMS

Competition presently does not exist in the computer generated vending game business because it is only now that the following two important components are economically available:

(1) The large scale integrated circuits (LSI) necessary to build the Terminal Units for less than $600 each.

(2) Time-Sharing Disk Supported Higher Order Language (Extended BASIC) running on a minicomputer system.

All non-computer generated games represent competition, but it is felt that the uniqueness, the multi-game feature, and the level of sophistication all taken together give the computer generated game an appreciable edge over its present day competitors.

It is important to note that while the level of sophistication of the computer generated games would make them more attractive to the better educated, it may have a negative effect on the less educated. The clientele of a truck stop would probably rather play the electronic dart board game, described in Section IV, because of its ease of play and colorful animation. It is doubtful they would want to play a computer generated game that would require them to read at a rate of 6 words per second. Because of this, computer

generated games would not always compete directly with the present types of games that are now available.

Computer generated game terminals being modern, attractive, and essentially silent may be placed in locations not presently serviced by today's vending games. Some potentially excellent locations are listed below in descending order of potential:

1. Campus game rooms
2. Campus snack shops
3. Bars catering to college students
4. Military clubs, (NCO, Officers, etc.)
5. Fraternity houses
6. Airport terminals
7. Bowling alleys
8. Shopping center malls
9. Motel lobbies

There is one new game now on the market that also uses a video display called "Odyssey" which was introduced in 1972 by the Magnavox Corporation as a home entertainment device. It attaches to any TV set, costs only $99, and allows a variety of games to be played on the home TV set. [4]

The Odyssey has two sets of controls that allow the players to move spots of light on the TV screen. This game is profitable to vend because of its low cost, however, it is not considered formidable competition because only the simplest game, Tennis, is easily learned. All other Odyssey games require extensive reading to understand their rules of play.

SECTION VI

BUSINESS PROJECTIONS AND MARKETING PLANS

A company known as Entertainment Systems International (ESI) plans to market game vending systems in three ways:

I. ESI placing the Terminals directly in establishments by offering the establishment a fixed percent of the Terminal's gross income.

II. Selling or leasing Terminals on an ESI owned system for placement by the Lessee.

III. Franchising the entire system in a geographical area such as a city or state.

In the following descriptions of each marketing plan, the "Distributor" is the party that owns or leases the Terminals and secures locations for them in various establishments. The "Company" is the party that owns the Computer System and provides monthly billing to the Establishments and/or the Distributors and maintenance services on both the Computer System and the Terminals. Under Marketing Plan I, ESI would be both the "Distributor" and the "Company". Under Marketing Plan II, ESI would only be the "Company". And, under Marketing Plan III, the Franchisee would be the "Company", having the right to distribute directly as in Plan I or through "Distributors" as in Plan II.

In each Plan the Distributor's sole responsibility is to secure locations for his Terminal Units, by making arrangements with the Establishments. Billing and all hardware, software, and communications maintenance is the responsibility of the Company.

Marketing Plan I

Under this plan, the Company is responsible for securing locations for its Terminals. Each Establishment will make its own collection of the coins and will be billed by the Company once a month at a rate of 60% of the gross income. Assuming a gross income of $500/mo., this yields the Company $300/mo. per terminal or $9600/mo. per system. If this rate of return is averaged for the year, it yields the Company a gross income of $115,200 on a total hardware cost of less than $70,000.

For a Terminal to produce $500/mo. using three minute duration games, it must be played an average of 3.35 hours per day which is 67 times per day.

Monthly revenue projections for this plan covering a range of $100/mo. to $1000/mo. Gross Income per Terminal is shown in Table I. Figure 6 shows a graph of these projected revenues.

The Company has direct expenses of $413/mo. for the On-Call Computer System Maintenance Contract and $480/mo. for the phone lines. In addition, the following miscellaneous expenses must be deducted:

Item	Estimated Cost/Mo.
1. Terminal Maintenance Costs	$ 160
2. Leased Terminal Insurance Costs	320
3. Marketing Expenses	100
4. Advertising Costs	50

MARKETING PLAN I - MONTHLY REVENUE PROJECTIONS

Monthly Gross Income per Terminal	Terminal Utilization (hours/day)		Establishment's Monthly Net (40%)	Company's Monthly Income		
	3 min. game	4 min. game		Gross per Terminal	Gross per System	Net per System (Fixed cost ≈ $3847/mo.)
$ 100	.67	.89	$ 40	$ 60	$ 1,920	$ (1,927)
200	1.34	1.78	80	120	3,840	(7)
300	2.01	2.67	120	180	5,760	1,913
400	2.68	3.56	160	240	7,680	3,833
500	3.35	4.45	200	300	9,600	5,753
600	4.02	5.34	240	360	11,520	7,673
700	4.69	6.23	280	420	13,440	9,593
800	5.36	7.12	320	480	15,360	11,513
900	6.03	8.01	360	540	17,280	13,433
1000	6.70	8.90	400	600	19,200	15,353

TABLE 1

MARKETING PLAN I - MONTHLY REVENUE PROJECTIONS

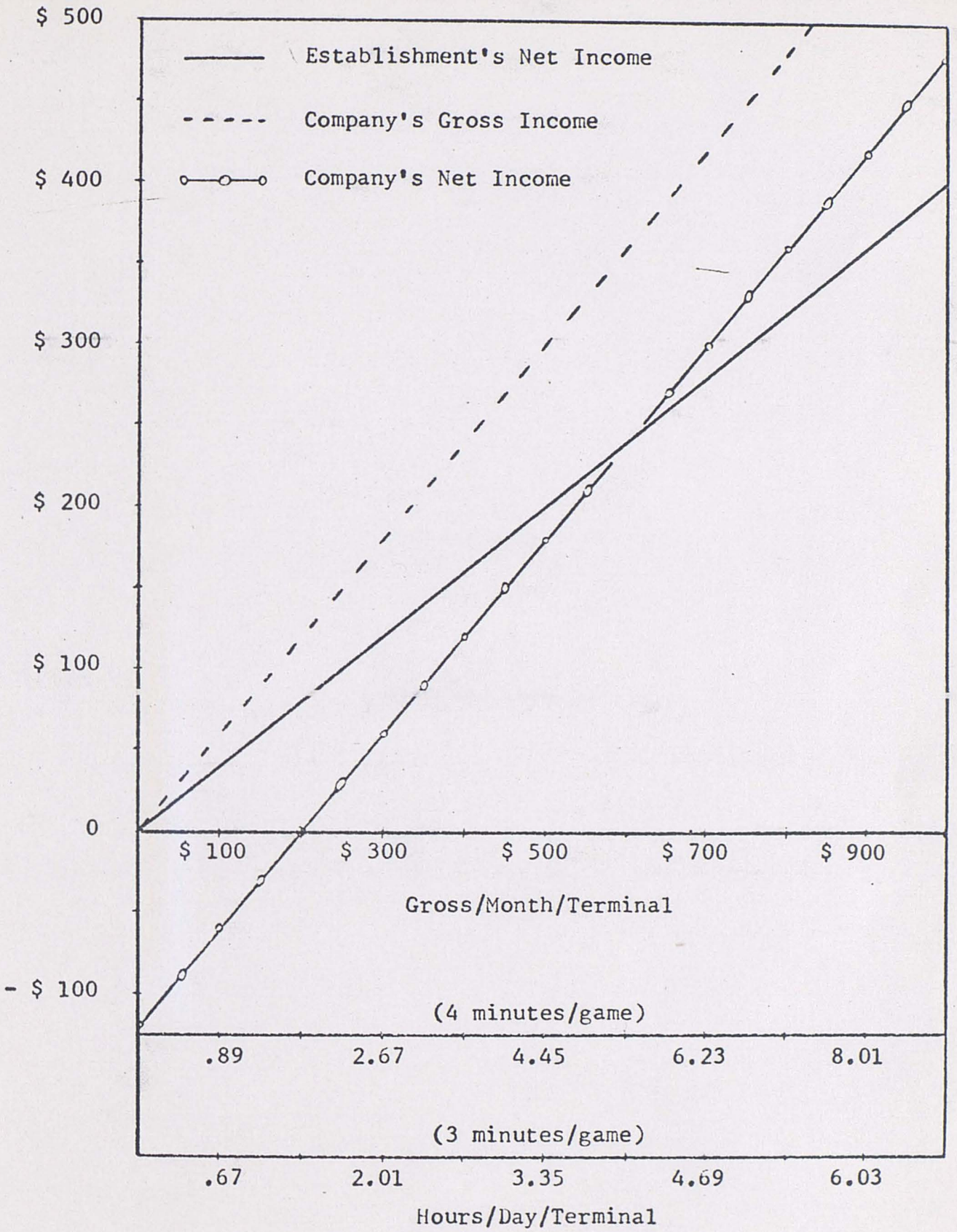


FIGURE 6

5.	State and Local Taxes	$ 10
6.	Secretarial Salary	480
7.	Legal and CPA Fees	50
8.	Postage and Stationary	15
9.	Office Rent	300
10.	Lease on Computer System (if applicable)	919
11.	Lease on Modems (if applicable)	206
12.	Lease on Terminals (if applicable)	344
	Estimated Total Monthly Fixed Expense:	$3847

Subtracting the monthly fixed expense from the System's assumed gross of $9600/mo. leaves a net monthly return of $5753 or $69,036 per year with a minimal capital investment of less than $5000.

Marketing Plan II

Under this plan, one or more Distributors would buy or lease the Terminals from the Company for placement in Establishments. The Company, utilizing the Computer System, would bill the Distributer each month for the following items per each Terminal:

A. Computer System Maintenance Contract: ($15.00/mo.)

The computer system will be covered by the manufacturer's On-Call Service Contract costing $413 per month. $15.00 per month is slightly more than 1/32 of this maintenance cost.

B. Terminal Maintenance Contract: ($10.00/mo.)

The ESI manufactured Terminals will be maintained by ESI personnel for a fixed monthly charge of $10.00 per month.

C. Phone Line Charge: ($15.00/mo.)

Standard voice grade phone lines will be used. These lines have an error rate of only 1 bit in 100,000 at 300 baud.

D. No Equity Terminal Lease: ($60.00/mo.)

The Terminal may be purchased from ESI for $2000 or a 3% non-equity producing lease may be drawn for a minimum term of one year with the first and last two months payable in advance.

E. Game Charges (Software): ($30.00/mo. avg.)

The Distributor can choose which games he wants to be available on his Terminal. The cost of each game per month is a function of its program size (number of bytes of core memory required). The following table illustrates the game cost per program size:

Program Size (bytes)	Price/Month
0 - 2999	$ 5.00
3000 - 4999	10.00
5000 - 6999	15.00
7000 - 8999	20.00
9000 +	25.00

Following are some examples of monthly game charges based on the above table:

Game	Size (bytes)	Price/Month
Artillery	2842	$ 5.00
Bandit	4894	10.00
Derby	6168	15.00

F. Royalty Charge: ($30.00 - $100.00/mo.)

The Royalty charge is billed at a rate of 10% of gross income per month. This monthly Royalty charge is not billed to a Terminal that grosses less than $300 in any month.

G. Miscellaneous Charges:

Two items in this category are -

(1) Premium Time Terminal Maintenance:

If Terminal maintenance is desired any time other than the normal five day 8 A.M. to 5 P.M. shift an additional charge is made at $20.00 per hour, portal to portal, plus travel at 10¢ per mile with a minimum charge of $40.00.

(2) Game Activation and Deactivation Charge:

After the initially requested games are installed (activated) on a Terminal, there is a charge to add or delete a game on that Terminal. These charges are billed as follows:

Add or delete 1 game	$ 30.00
Add or delete 2 games	50.00
Add or delete 3 games	70.00
Add and delete 1 game	50.00
Add and delete 2 games	90.00
Add and delete 3 games	120.00

Summarizing these costs to the Distributor, the Companies' income looks like this:

Income Source	Cost/Mo./Terminal
A. System Maintenance	$ 15.00
B. Terminal Maintenance	10.00
C. Phone Line	15.00
D. Terminal Lease	60.00
E. Games (avg.)	30.00
F. Royalty (avg.)	50.00
Total:	$180.00

These figures are based on a Terminal grossing $500/mo. yielding $200/mo. to the Establishment on a 60/40 split, $120/mo. to the Distributor (both with minimal investment), and $180/mo. to the Company.

Assuming all the Terminals average $500/mo., the System would yield the Company $5760/mo. gross or $69,120/year.

Subtracting the total estimated fixed expense of $3847/mo. from $5760/mo. yields a net income per System of $1913/mo. or $22,956/year.

This $22,956/year net is based on leasing the Computer System ($42,721), the 32 Terminals ($16,000), and the 64 Modems ($9600) for five years at 2.15% per month accruing 90% paid in equity. The only investment required is the first and last month's lease payments on the total lease amount of $68,321 which would be $2938.

Monthly revenue projections for this plan covering a range of $100/mo. to $1000/mo. Gross Income per Terminal is shown in Table 2. Figure 7 shows a graph of these projected revenues.

A presentation to Distributors of this marketing plan is contained in Appendix II.

MARKETING PLAN II - MONTHLY REVENUE PROJECTIONS

Monthly Gross Income per Terminal	Terminal Utilization (hours/day)		Proprietor's Monthly Net (40%)	Company's Monthly Income									Distributor's Monthly Net per Terminal
	3 min. game	4 min. game		A	B	C	D	E	F	G	H	I	
$ 100	.67	.89	$ 40	$15	$10	$15	$60	$30	$ 0	$130	$4,160	$ 313	$(70)
200	1.34	1.78	80	15	10	15	60	30	0	130	4,160	313	(10)
300	2.01	2.67	120	15	10	15	60	30	30	160	5,120	1,273	20
400	2.68	3.56	160	15	10	15	60	30	40	170	5,440	1,593	70
500	3.35	4.45	200	15	10	15	60	30	50	180	5,760	1,913	120
600	4.02	5.34	240	15	10	15	60	30	60	190	6,080	2,233	170
700	4.69	6.23	280	15	10	15	60	30	70	200	6,400	2,553	220
800	5.36	7.12	320	15	10	15	60	30	80	210	6,720	2,873	270
900	6.03	8.01	360	15	10	15	60	30	90	220	7,040	3,193	320
1000	6.70	8.90	400	15	10	15	60	30	100	230	7,360	3,513	370

Company's Income Key:

A - System Maintenance
B - Terminal Maintenance
C - Phone Line
D - Terminal Lease
E - Games (avg.)
F - Royalty (10% of gross)
G - Gross per Terminal
H - Gross per System
I - Net per System (fixed cost ≈ $3847/mo.)

TABLE 2

MARKETING PLAN II - MONTHLY REVENUE PROJECTIONS

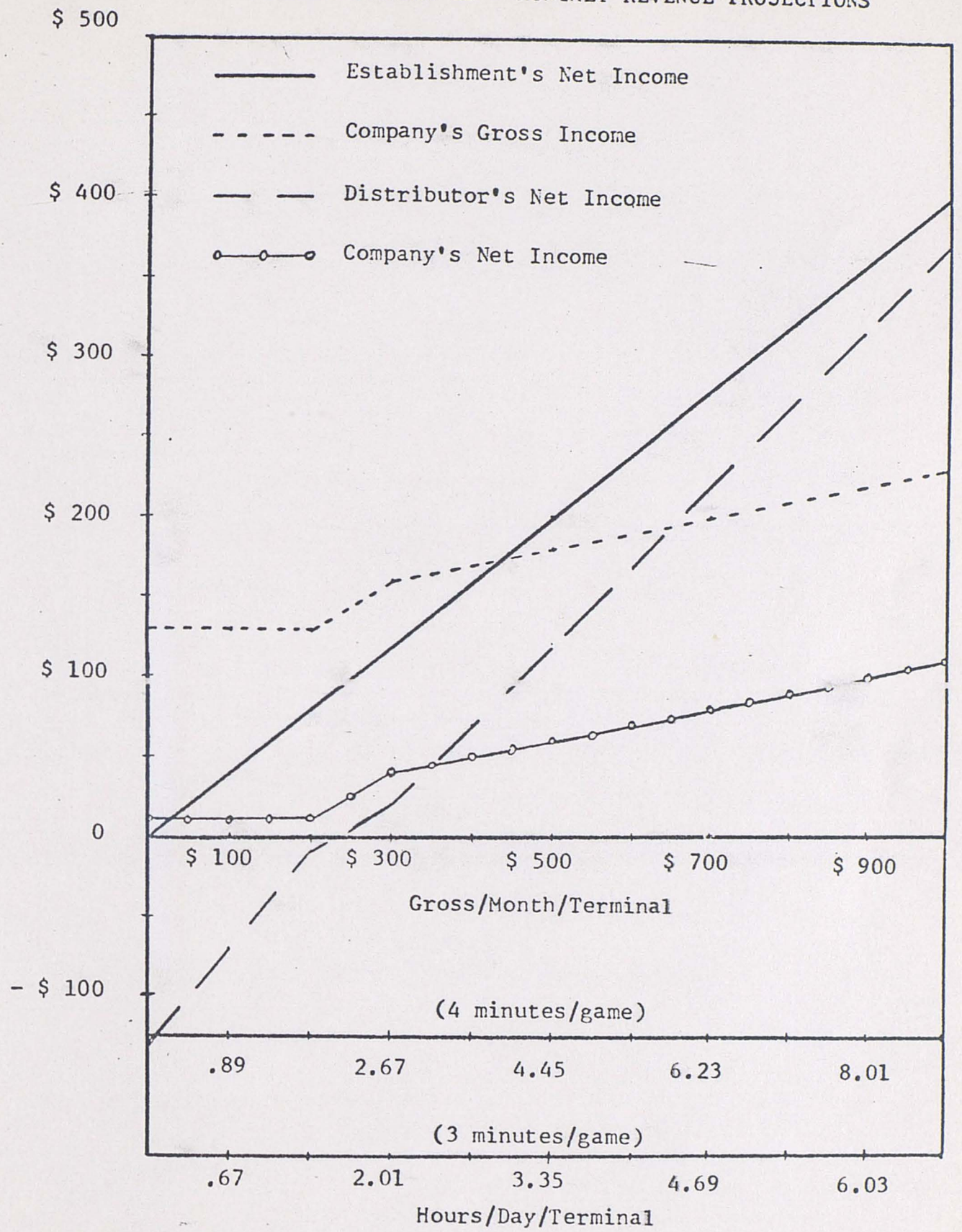


FIGURE 7

Marketing Plan III

Under this plan ESI will sell to the Franchisee as many systems as the Franchisee desired for his Franchised area. ESI will also provide all of the software and training required to enable the Franchisee to effectively operate under Plan I or II previously described.

The Franchise Fee for the exclusive rights to a geographical area such as a city or a state is set at 1¢/person population based on the latest National Census. This fee is for the exclusive rights to all the software (games) the Company has made available and for complete training in operations, maintenance, and marketing.

The Franchisee must purchase all of the required hardware from ESI at the manufacturer's list prices. In addition, the Franchisee must pay a Royalty of 2% per month to ESI on all gross revenue. This amounts to ½¢ per game played on each Terminal.

As an example, the city of Miami, based on the 1970 census, has a population of 334,859 so its Franchise Fee would be $3,349. ESI's second system would receive an average manufacturer's OEM discount of 15% yielding a hardware profit of $11,250 on a $75,000 (list price) system. Therefore, ESI would earn $14,599 on the sale of the Miami area and if each of the 32 Terminals on the System averaged $500/mo., ESI would realize a Royalty of $320/mo. or $3840/yr.

Table 3 shows the monthly revenue projections and the gross profit resulting from franchising the State of Florida.

Table 4 shows, on a month-to-month basis, the first year's revenue projections from the Florida franchise. Figure 8 shows a graph of these month-to-month net income running totals for both the

MARKETING PLAN III - MONTHLY REVENUE PROJECTIONS

City	No. of Systems	Approx. Gross Profit/Sale	No. of Terminals
Jacksonville	3	$ 45K	96
Daytona Beach	1	15K	32
West Palm Beach	1	15K	32
Ft. Lauderdale	1	15K	32
Miami	4	60K	128
Tampa	2	30K	64
St. Petersburgh	2	30K	64
Orlando	2	30K	64
Gainsville	1	15K	32
Tallahassee	1	15K	32
Pensacola	1	15K	32
Totals:	19	$ 285K	608

Monthly Gross Income per Terminal	Terminal Utilization (hours/day)		Monthly Royalty (2% of Gross)	
	3 min. game.	4 min. game	per Terminal	608 Terminals
$ 100	.67	.89	$ 2	$ 1,216
200	1.34	1.78	4	2,432
300	2.01	2.67	6	3,648
400	2.68	3.56	8	4,864
500	3.35	4.45	10	6,080
600	4.02	5.34	12	7,296
700	4.69	6.23	14	8,512
800	5.36	7.12	16	9,728
900	6.03	8.01	18	10,944
1000	6.70	8.90	20	12,160

Franchised Area: State of Florida

Franchise Fee: $67,890.00

TABLE 3

MARKETING PLAN III - FIRST YEAR'S REVENUE PROJECTIONS* FOR THE STATE OF FLORIDA

Month	City	Systems per City	Total Systems Installed	Franchisee ($K)			E. S. I. ($K)		
				Income**	Royalty	Net Income Running Total	Income	Source Code	Net Income Running Total
1				$ 0	$ -68	$ -68	$ 68	a	$ 68
							45	b	
2	Jacksonville	3	3	17	-1	-52	1	c	114
							15	b	
3	Daytona Beach	1	4	23	-1	-30	1	c	130
							15	b	
4	West Palm Beach	1	5	29	-2	-3	2	c	147
							15	b	
5	Ft. Lauderdale	1	6	35	-2	30	2	c	164
							60	b	
6	Miami	4	10	58	-3	84	3	c	227
							30	b	
7	Tampa	2	12	69	-4	149	4	c	261
							30	b	
8	St. Petersburg	2	14	81	-4	225	4	c	295
							30	b	
9	Orlando	2	16	92	-5	312	5	c	330
							15	b	
10	Gainesville	1	17	98	-5	405	5	c	350
							15	b	
11	Tallahassee	1	18	104	-6	503	6	c	371
							15	b	
12	Pensacola	1	19	109	-6	606	6	c	392

TABLE 4

Legend and Footnotes

E. S. I. Income Source Code:

a - Franchise Fee

b - Profit/System

c - Royalty

* Based on a Gross/Terminal of $500/month.

** Net per System from Plan I ($5753 @ $500/mo. Gross/Terminal).

TABLE 4 continued

PLAN III

FIRST YEAR'S REVENUE PROJECTIONS FOR THE STATE OF FLORIDA

(Net Income times 1000)

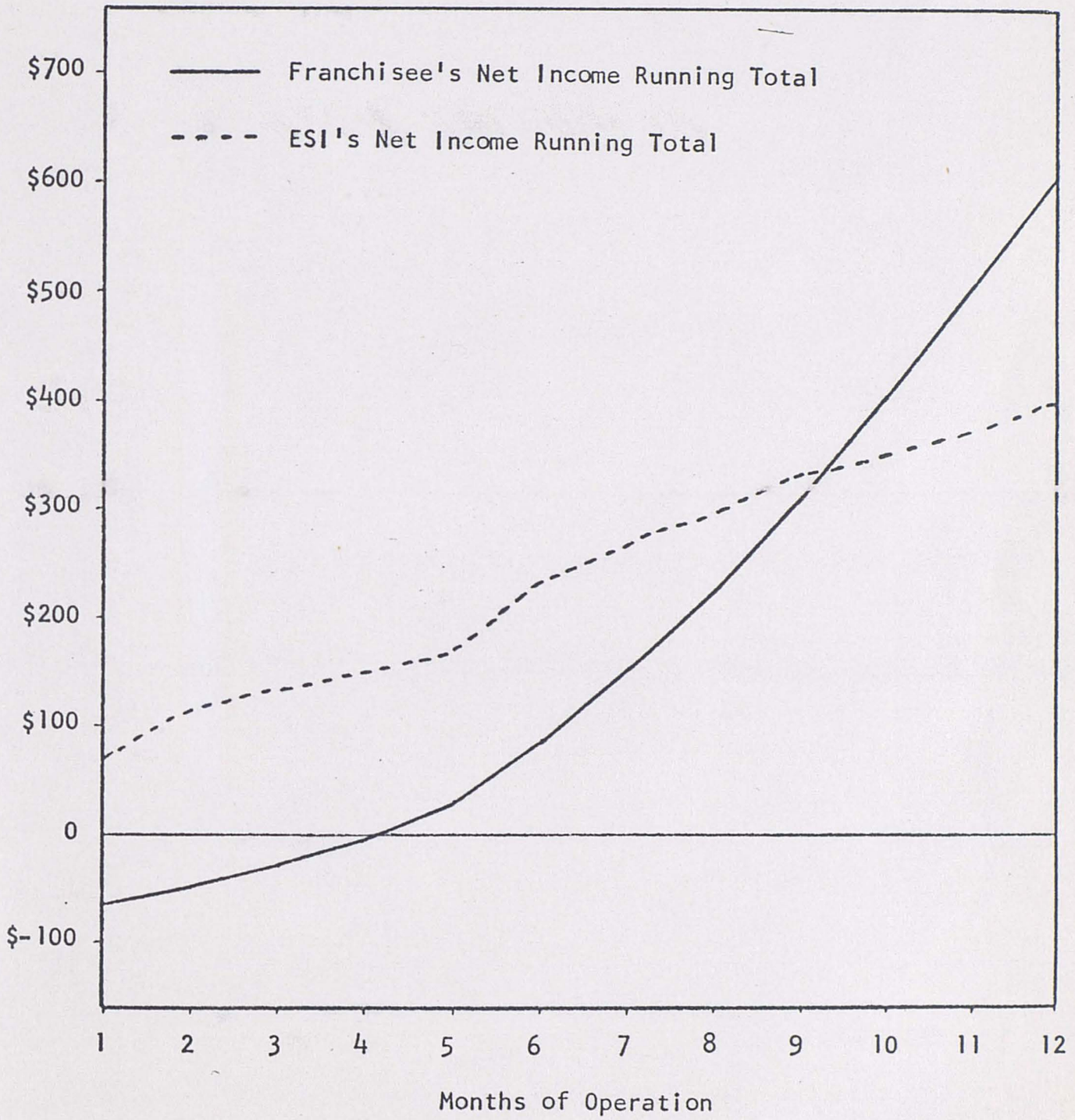


FIGURE 8

Franchisee and ESI.

Advertising Income Potential

On the large screen models that may be watched by 20 or 30 people, it is feasible to insert 10 or 20 seconds of advertising between the games. A charge of 1/5¢ per second would yield 36¢ for three minutes of advertising. This would have the effect of increasing the over-all yield per Terminal.

SECTION VII

FUTURE SYSTEMS

This section is broken down into three time periods - The Near Future (9 to 18 months), the Intermediate Future (2 to 4 years), and the Distant Future (5 to 10 years).

Near Term or 2nd Generation Systems (9 to 18 months):

Due to the nearness of this time period, the systems described briefly here could conceivably be the first generation of computer generated vending game systems rather than a later generation.

Random Access Slide Projector Enhanced System:

This system incorporates a random access slide projector as an integral part of each terminal. The computer, by sending special ASCII codes to the Terminal Unit can select the slide to be shown. Examples of how this feature might be used are:

(1) To show a representative pictures of the game being played like horses during the Derby Game and a slot machine during the Bandit Game.

(2) To display the playing instructions when more complex games like Baseball, Football, Golf, and Star Trek are being played.

(3) To display colorful commercial advertisements

during the time the machine is not being played, as an added revenue producer.

Random access slide projectors are presently not being mass produced and consequently their price is in the order of $1500 each for small quantities of less than 10. For a 32 terminal system, this price would come down to $400-$500 each with each projector having the capacity of over 100 slides. The present maximum slide access time is less than one second.

96 Terminal Minicomputer System:

This system is designed to reduce the computer system cost per terminal by adding capabilities to the computer system for a minimal increased cost. This additional hardware and associated software changes should allow three times as many terminals to be "on-line" without an appreciable increase in each terminal's response time.

Three changes that would be required to upgrade a 32 terminal system to a 96 terminal system are:

(1) Add Hardware Multiply/Divide. This option is priced at $1000.

(2) Add Hardware Floating Point. This option is priced at $4000.

(3) Rewrite all software (games) in a very fast executing language like Data General's Real-Time FORTRAN 5. This language must be multi-tasking, re-entrant, and disk supported.

Addition of an Automatic Coin Dispensing Unit:

Terminals equipped with a coin dispensing unit are programmed to pay off any winnings in cash. This obviously only has application in those states and countries where gambling devices are allowed. If this multi-game gambling device proves to be attractive to the public, the potential market is enormous. Another application for "cash payoff" terminals would be aboard the Caribbean cruise liners based in Miami. These vacation cruise ships have slot machine rooms that are opened to the passengers when the ship leaves the 3 mile limit. One System could be installed per ship with 32 terminals located throughout the ship to become activated when the 3 mile limit is crossed. The terminals could be used to display special announcements of shipboard social activities when not being played.

One coin dispensing unit under design review is the NCR change dispenser found on many of their cash registers used in supermarkets. This unit sells for $435 in quantity one and has the following cartridge capacities:

Coin	Quantity	Amount
Quarters	288	$ 72.00
Dimes	260	$ 26.00
Nickels	90	$ 4.50
Pennies	330	$ 3.30
	Total:	$105.80

A disadvantage in this type of dispenser is that there is no means by which the terminals coin intake can be used to replenish the dispenser's coin supply. This means that periodically an attendant would have to replace the coin cartridges before they get low, otherwise, they would automatically disable the Terminal Unit from any further play.

Intermediate Term or 3rd Generation System (2 to 4 years):

In this time frame an audio response Terminal Unit is planned. A device similar to the VS-IV Voice Synthesizer, made by Federal Screw Works, is to be incorporated as an integral part of the Terminal Unit. The ASCII characters will be decoded as 8-bit phoneme commands to the synthesizer which, utilizing analog circuitry, will simulate electronically the human vocal system thereby allowing the Terminal Units to "speak" to the players.

These units are presently selling for $2000 which means that they could be built for less than $1000. If the price to ESI for this voice enhancement equipment becomes less than $400 per terminal, this feature will be added. It is conceivable that this could occur much sooner than the 2 to 4 year period persently forecast.

Distant Term or 4th Generation System (5 to 10 years):

For this time frame, the cost of the computer system and memory will be so low each Terminal Unit will be able to have its own computer system. This will eliminate the need for the MODEMS and phone lines.

The video display device used in the terminal of this era will have graphics capability. That is, it will be able to display objects

in motion, not just letters and numbers as on the earlier generation terminals.

The cost of adding color capabilities to the video display should be quite nominal by this time, allowing for colorful animation of the games being played. As an example, the Derby game would actually display multi-colored horses actually racing, not just printing the horses names as displayed on the present day terminals.

SECTION VIII

CORPORATE PLANS

Entertainment Systems International, Inc. (ESI) was incorporated under the Laws of the State of Florida on the 20th day of March, A.D., 1973.

The Company, through a small number of substantial investors (less than five), plans to grow in the following three distinct stages during the first year.

Stage I

This stage is designed to verify marketability with a minimum of expenditures. The plan is to purchase only those items necessary tc enhance an available, small computer system to allow a single prototype CHALLENGE* unit to function remotely during the evening hours. This Unit will be placed in a lounge frequented by intelligent clientele for a two-week trial period. If revenues meet expectations, this stage will be terminated and Stage II will begin.

Important parameters of Stage I are:

Development Period	4 weeks
Trial Period	2 weeks
Total Duration	6 weeks

Items to Purchase	Cost
Video Display Unit	$2400
Acoustic Coupler	250

*CHALLENGE is a proposed copyright name given to the multi-game video display terminal unit.

Keyboard & Interface	500	
Coin Box	20	
Console Cabinet	300	
		$3470

Other Expenses	Cost	
President's Salary ($300/week)	$1800	
Computer System Rental	600	
Corporate Books	62	
Legal Fees	250	
		$2712

Stage I Total Cost:	$6182
Stage I Salvage Value:	1325
Stage I Potential Net Loss:	$4857

Stage II

This stage is designed to verify the functionability of the full 32 Unit System and to gain marketing experience in dealing with local Distributors.

The following items will be accomplished during this Stage:

1. Implement a full 32 Unit System
2. Set up and execute marketing policies with Distributors.
3. Copyright the name "CHALLENGE".
4. File for Patents.
5. Evaluate Random Access Slide Projectors.
6. Evaluate Coin Dispenser Units.
7. Secure Office Space

8. Evaluate the merits of converting the programs to FORTRAN.

9. Implement more games in more languages.

Important parameters of Stage II are:

Development Period	16 weeks
Trial Period	4 weeks
Total Duration	20 weeks

Items to Purchase	Cost	
Computer System	$45,000	
64 MODEMS ($200 each)	12,800	
32 Video Display Units ($500 each)	16,000	
32 Ruggedized Consoles ($200 each)	6,400	
32 Coin Boxes ($15 each)	480	
Coin Dispenser Unit	435	
Random Access Slide Projector	1,500	
Office Furniture	1,000	
		$83,615

Other Expenses	Cost
President's Salary ($400/week)	$ 8,000
Part-time Software Support ($10/hr.)	4,000
Part-time Hardware Support ($10/hr.)	2,000
Secretary ($120/week)	2,400
Legal and CPA Fees	750
Office Rent ($300/mo.)	1,500
Computer System Maintenance ($480/mo.)	480
CHALLENGE Unit Maintenance	160
Taxes	100

Postage & Stationery	$ 150	
Telephone Lines and Calls	600	
Travel	700	
Printing	300	
		$ 21,140
Stage II Total Cost:		$104,755

Revenue derived from one month of operation	Amount
32 CHALLENGE Leases (last 2 months at $60/mo.)	$ 3,840
System Income (based on $200/mo. avg. gross/unit)	4,800
Stage II Total Income:	$ 8,640
Stage II Salvage Value:	$ 29,400
Stage II Potential Net Loss:	$ 66,715
Cumulative Potential Net Loss (Stages I & II):	$ 71,572

Stage III

This stage is to be initiated if Stage II meets all of its design objectives and revenue expectations in order to rapidly cover the country with CHALLENGE Units.

The main function of this stage is to rapidly sell city and state franchises as a means of cornering the market. Also during this stage a strong research and development (R & D) group must be organized to keep our products ahead of the emerging competition.

The following items will be accomplished during this stage:

1. Set up and execute Franchising Agreements
2. Evaluate Voice Synthesizers
3. Implement the Slide Projection Feature

4. Implement the Coin Dispenser Feature
5. Implement a 96 Unit System
6. Staff R & D Group
7. Staff Marketing Group
8. Staff Maintenance Group
9. Staff Training Group
10. Staff Accounting Group
11. Investigate a Public Offering

Important parameters of Stage III are:

Development Period	8 to 16 weeks
Operating Period	10 to 18 weeks
Total Duration	26 weeks

Items to Purchase		Cost	
10	Computer Systems	$350,000	
640	Modems	96,000	
320	Video Displays	160,000	
320	Consoles & Coin Boxes	51,200	
	Office Furniture	5,000	
	Voice Synthesizer	2,000	
	Misc. Lab Equipment	30,000	
			$694,200

Other Expenses	Cost
Salary	
President ($500/week)	$ 13,000
V. P. Software ($450/week)	11,700
V. P. Hardware ($450/week)	11,700
V. P. Marketing ($450/week)	11,700

Engineer ($300/week)	$ 7,800	
Programmer ($300/week)	7,800	
2 Field Engineers ($200/wk. ea.)	10,400	
Instructor ($200/week)	5,200	
CPA ($300/week)	7,800	
3 Secretaries ($130/week)	10,140	
1 Receptionist ($100/week)	2,600	
Legal Fees	1,500	
Office Rent ($900/mo.)	5,400	
Taxes	600	
Postage & Stationery	600	
Telephone Lines and Calls	5,000	
Travel	6,000	
Printing	2,000	
Advertising	20,000	
		$140,940
Stage III Total Cost:		$835,140

Revenue Derived from 5 Months of Operation	Amount
ESI Owned System Income (based on $300/mo. avg. gross/mo.)	$ 30,600
Franchise Fee (Assume Florida)	67,890
Sale of 10 Complete Systems at $75 K each	750,000
Royalties (based on $500/mo. gross/unit)	9,000
Stage III Total Income:	$857,490
Stage III Salvage Value:	46,900
Stage III minimum Net Gain:	$ 69,250
Cumulative Potential Net Loss (Stages I, II & III):	$ 2,322

SECTION IX

DETAILED HARDWARE DESCRIPTION

The initial Central Computer System will be made up of the items shown in Appendix I on the Quotation from a major minicomputer manufacturer. Following, is a detailed description of these items:

Nova 800 Jumbo CPU - The Nova 800 Central Processor Unit has a full memory cycle time of 800 nanoseconds, and executes arithmetic and logical instructions in a single 800 nanosecond cycle. It has a fully-parallel, 16-bit, multi-accumulator central processor. The Nova 800 Jumbo is built in a 10½-inch high, 19 inches wide, 23 inches deep chassis, and contains slots for seventeen 15-inch square printed circuit boards. Two of these slots are used for the CPU boards. The Nova 800 comes with the following items as standard equipment: programmer's console, direct memory access (DMA) channel, and automatic interrupt source identification.

Four 8K Word Core Memorys - Each of these four 8192 word core memory boards contain all the necessary electronics on a 15-inch square subassembly which plugs directly into one of the chassis slots with no wiring modifications giving the Central Computer System a total of 32,768 16-bit words of core storage. This is equivalent to 65,536

characters (bytes) of storage. The Nova 800 core memories have a cycle time of 800 nanoseconds.

Power Monitor and Auto-Restart - This CPU option provides power level detection and a flag which is attached to the program interrupt and can be sensed by the program. It allows the program to become aware of an imminent power failure so it can provide for an orderly shut down. The program automatically restarts at location 0 when power is restored.

Automatic Program Load - This CPU option (Hardwired bootstrap loader) is made up of two LSI chips that contain thirty-two words of read-only memory (ROM). Pressing the program load switch on the console starts the processor in a special sequence that deposits the read-only words into locations 0-37 and then begins normal program execution at location 0. The 32 words deposited in memory from the two ROM's are the "bootstrap" loader program. This option alleviates the necessity of having to key in the Bootstrap Loader program, using the console data switches, in the event memory reloading is required.

ASR-33 Teletype and I/O Interface - This peripheral serves as a console printer and keyboard input device. The I/O interface is full duplex, that is, it allows the computer to be outputting data to the printer at the same time as data is being entered on the keyboard. The printing speed of this device is ten (10) characters per second.

High Speed Paper Tape Reader and Control - This peripheral is used primarily to quickly load the computer vendor's latest released system software when updating to the newest operating system. It senses eight-channel, fan-fold, perforated Mylar or paper tape photoelectrically at 300 characters per second.

256K Word Fixed Head Disk and Control - This peripheral provides fast auxiliary storage for the following uses:

(a) Real-time Disk Operating System (RDOS) non-core resident sub-routines.

(b) A file for each game program available on the system.

(c) A swap area where each terminal's core image is to be saved when not executing.

This peripheral has an average latency time of 8.4 milliseconds and a data transfer rate of one word every 8 microseconds. It is rack mountable standing 12¼ inches high and 19 inches wide including the power supply and data channel circuitry and uses a 10-surface disk pack.

Thirty-two (32) Asynchronous Communications Interfaces - These asynchronous communications interfaces are supplied four-to-a-board thereby using 8 slot in the Nova 800 chassis. Each interface is connected, through a Junction Panel, to a Bell type 103G Modem which is connected through a phone line to a Terminal Unit. Each interface allows either half or full duplex operation and line speed may be as high as 9600 baud with the proper modems and phone line. The high speed is

attainable since both the input and the output is double buffered containing shift registers for automatic character assembly and disassembly. In the ESI systems these interfaces will be set to run at 300 baud or about 30 characters per second.

Real-Time Clock - This device is used by the operating system (swapping Extended Time Sharing BASIC) to Time Division Multiplex (TDM) or time slice each Terminal's use of the CPU. The Clock provides a flag which can be enabled by the program to provide a program interrupt at a fixed frequency. The four frequencies, which are selectable under program control, are 10, 100, 1000 and 60 Hertz.

The Remote Terminal Units conform to the specifications listed in Appendix V. Three key features of this unit that are used to attract customer's attention are:

(1) Character Blinking - Any group of characters can be made to blink at a rate of two times per second. This feature is used to accent important information on the screen as the number of plays remaining.

(2) Reverse Video - This feature allows any group of characters to be displayed in black on a white background. This feature is used to accent the title of a game being played and any other key information.

(3) Audio Response Character - This feature allows the program to issue the ASCII BELL character causing a "beep" sound to be heard at the Terminal Unit. This feature is used to alert the customer that the Terminal is ready for his response.

SECTION X

DETAILED SOFTWARE DESCRIPTION

The source (game) programs are written in an extended BASIC language. This language has extensions that allow it to communicate with a disk for data file storage and program chaining.

The system is designed to have a game "menu" program running on each terminal that is unique to it, since each terminal may have different games available. This menu program will display the names of all the games available on that terminal with their associated cost and instructions on how to initiate the play. A printout of the game menu and the games as they were played is included in Appendix III.

A substantial attempt has been made to human-engineer the games with the following goals in mind: ease in understanding how to play, create a desire in the player to continue playing, and create a desire in an observer to want to play.

Following are some examples of how the programs try to create the desire to play the same game again:

> Artillery Game - A free game is awarded if your Skill Factor Rating (targets destroyed ÷ rounds expanded) exceeds 50%. This presents a challenge to the player to try to win a free game. Also, an observer will develop a desire to try to beat the last player's Skill Factor Rating.

Derby Game - A free race is awarded if your total winnings exceed $50. If there are any winnings less than $50, a message appears telling the player that he may carry these winnings over to the next race provided he selects the Derby Game again. This is an enducement to play the same game again.

Bandit Game - This game, like the Derby Game, awards free games and also announces that winnings may be retained for the next game if the Bandit Game is selected again.

In the area of diagnostic error messages, the programs clearly tell the player what he has done wrong. Some examples of these diagnositc messages are:

Artillery Game - Giving an elevation angle of greater than 89 degrees causes the following error message: MAX. ELEVATION OF GUN IS 89 DEGREES.

Derby Game - Selecting a horse number greater than 8 causes the following error message: HORSE NO. MUST BE BETWEEN 1 AND 8.

Bandit Game - Betting more money than you have causes the following error message: ILLEGAL BET, YOU ONLY HAVE $XX.

The following attention-getters have been incorporated into the programs to provide a dynamic effect to the displays:

Menu Display - The four astericks on each side of the corporate name flash two times per second. Also, the corporate name is displayed in reverse video (black letters on a white field).

Game Titles - When a game starts, the screen is first cleared and then the name of the game appears at the top of the screen, blinking in reverse video.

Artillery Game - The TARGETS REMAINING number is displayed blinking two times per second. Also, when a target is destroyed, the conformation is displayed in reverse video.

Audio Prompter - Whenever a program requires an input from the keyboard to proceed, two audio "beeps" are given to alert the player that keyboard input is now required.

APPENDIX I

MINICOMPUTER SYSTEM QUOTATION

DATA GENERAL CORPORATION
Route 9
Southboro, Massachusetts 01772
Tel. (617) 485-9100 TWX 710-390-0309

QUOTATION

QUOTATION NO. SL-22102

PLEASE REFER TO THIS QUOTATION NO. IN ALL CORRESPONDENCE AND ORDERS.

TO: Entertainment Systems International
1350 Orange Avenue Suite #239
Winter Park, Florida 32789

NEAREST DGC SALES OFFICE
7000 Lake Ellenor Drive
Suite #114
Orlando, Florida 32809
(305) 851-8230

THANK YOU FOR YOUR INQUIRY. WE ARE PLEASED TO QUOTE AS FOLLOWS: 32K Word, 32 Terminal Swapping Extended BASIC NOVA 800 RDOS System

DATE	REFERENCE:	FREIGHT CHARGES:	TERMS: NET CASH	F.O.B. SOUTHBORO, MASS.
2/20/73		PREPAY AND ADD		

ITEM	QUANTITY	Type No.	DESCRIPTION	UNIT LIST PRICE	DISC.	UNIT NET PRICE	TOTAL
1	1	8202	Nova 800 Jumbo CPU	$ 4450	10	$ 4005	$ 4005
2	4	8215	8K Word Core Memory	4400	19	3564	14,256
3	1	8206	Power Monitor & Auto-restart	400	10	360	360
4	1	8208	Automatic Program Load	400	10	360	360
5	1	4007	I/O Interface Subassembly	200	10	180	180
6	1	4010	Teletype I/O Interface	150	10	135	135
7	1	4010E	ASR-33 Teletype (TDT)	1400	N/A	1400	1400
8	1	4011	Paper Tape Reader Control	850	10	765	765
9	1	6013	300 cps Paper Tape Reader	1150	10	1035	1035
10	1	4019	Fixed Head Disc Control	3000	10	2700	2700
	1	6002	256K Word Novadisc	6750	10	6075	6075
11	8	4063	Four Asynchronous Interfaces	1500	23	1155	9240
13	1	4051	Modem Junction Panel	500	10	450	450
14	2	4052A	Ten-foot cable for 4051	200	N/A	200	400
15	1	1012D	74½" high Rack & Blower Unit	1000	N/A	1000	1000
16	1	4008	Real-Time Clock	400	10	360	360
						Total:	$42,721
						Lease Cost/Mo.:	$ 919
						On-Call Maintenance/Mo.:	$ 413
						Total Cost/Mo.:	$ 1332
						Total Cost/Mo./Terminal:	$ 42

ATTACHMENTS:
DGC Discount Agreement Form 202
DGC Program License Agreement Form 500
DGC Program Availability Form 501

↓DELIVERY SCHEDULE↓
90 days ARO

THIS QUOTATION SHALL REMAIN FIRM FOR 30 DAYS FROM THE DATE HEREOF, UNLESS MODIFIED IN WRITING BY DATA GENERAL CORPORATION PRIOR TO OUR ACCEPTANCE OF YOUR CONTRACT OFFER, AND IS SUBJECT TO THE TERMS AND CONDITIONS HEREON AND ON THE REVERSE SIDE AND EXECUTION OF THE ATTACHED AGREEMENTS. ANY CONTRACT RESULTING FROM THIS QUOTATION MUST BE SIGNED IN SOUTHBORO, MASS. BY A DULY AUTHORIZED REPRESENTATIVE OF DATA GENERAL CORPORATION.

BY_____
Stanley M. Levin

S871
REV 7/71

CUSTOMER COPY

ON-CALL MAINTENANCE CONTRACT

Item No.	Qty	Type No.	Price	Extended Price
1	1	8202	$36	$ 36
2	4	8215	35	140
3	1	8206	1	1
4	1	8208	2	2
5	1	4007	2	2
6	1	4010	1	1
7	1	4010E	30	30
8	1	4011	7	7
9	1	6013	12	12
10	1	4019	25	25
11	1	6002	50	50
12	8	4063	13	104
13	1	4051	NC	NC
14	2	4052A	NC	NC
15	1	1012D	NC	NC
16	1	4008	3	3
			Total/Month:	$413

APPENDIX II

DISTRIBUTOR PRESENTATION

ENTERTAINMENT SYSTEMS INTERNATIONAL

presents

"CHALLENGE"

The Multigame Video Display

CHALLENGE offers a whole new concept in game vending.

CHALLENGE provides the following totally unique features never before available to Distributors:

* No Collections Ever Required.
* Life Time Warranty on All Parts.
* No Service Ever Required.
* Can Play Over 30 Different Games.
* Can Play In More Than 5 Different Languages.

WHAT is it?

CHALLENGE is the first of a new line of unique game vending machines that allow the patrons to select the game of their choice from a large list of games available on each machine.

The heart of the unit is a very powerful, scientifically programmed digital computer. The patron plays against (challenges) this computer by inputting his commands on the console keyboard and observing the computer's responses on the TV like video display screen.

Some of the games CHALLENGE has been "taught" to play are:

* Artillery
* Derby
* Bandit
* Blackjack
* Craps
* Football
* Baseball
* Golf
* Tic-Tac-Toe
* Battleship
* Bingo
* Chess
* Roulette
* Moo
* Star Trek
* S.C.P. (Playboy, 12/69)

CHALLENGE has been programmed to play these games in most of the major world languages. Each CHALLENGE unit can play all of the games listed above in up to five different languages, thereby allowing the player to select both the game and the language of his choice.

Because of this multi-game, multi-language capability, many CHALLENGE units can be located side by side in high volume establishments.

WHERE should it go?

Our market research has shown CHALLENGE units to be most productive in locations frequented by intelligent clientele. This is because CHALLENGE offers a mental "challenge" never before present on game vending machines. Some of the best locations for CHALLENGE units are:

* Campus Game Rooms
* Campus Snack Shops
* Bars Catering to College Students
* Military Clubs (NCO, Officers, etc.)
* Bowling Alleys
* Airport Terminals
* Shopping Center Malls
* Motel Lobbies
* Fraternity Houses

HOW is it marketed?

Distributors may purchase a CHALLENGE unit for $2000 or a $60 per month lease may be drawn for one year requiring the first and last two payments in advance.

The Distributor's sole responsibility is to find suitable locations for the units and to negotiate an equitable percentage split for the Establishments. Since CHALLENGE is a unique device, we recommend the Establishments receive no more than 40% of the gross income.

The first of each month Entertainment Systems International (ESI) mails to both the Establishment and the Distributor detailed computer

generated statements covering the activity of each CHALLENGE unit. These statements show the amount of income derived from each available game on the Unit and also the total income produced by the Unit during the previous month. This information is readily available on the central computer that plays the games on each CHALLENGE unit. Since ESI is providing this computer generated detailed accounting information, there is no longer a need for the Distributor to make collections. Consequently, the Establishment should be given the key to the Units' coin box so it can be emptyed periodically. Included with the monthly statements from ESI to the Establishments are instructions to send a check to the respective Distributors for the agreed upon percentage of gross. ESI suggests this amount should be 60%. It is the Establishment's responsibility to discourage slugs, as under this arrangement it becomes their loss.

In addition to collections, the Distributor is not required to become involved with installation, repairs, or preventive maintenance as these functions are ESI's responsibility.

ESI also mails to each Distributor a monthly itemized statement listing the following chargeable items for each CHALLENGE unit in his possession:

	Item	Charge
A.	Computer System Maintenance	$15.00
B.	CHALLENGE Unit Maintenance	10.00
C.	Telephone Line (approx.)	15.00
D.	CHALLENGE Unit Lease (if applicable)	60.00
E.	Games Available (approx.)	30.00
F.	Royalty Fee (10% of gross)	xx.xx

As an example, a unit producing $500 per month would net the Establishment $200 per month and the Distributor $120 per month based on a 40%/60% agreement between the Establishment and the Distributor respectively.

The following Chart and Graph gives monthly revenue projections for a single CHALLENGE Unit:

"CHALLENGE"

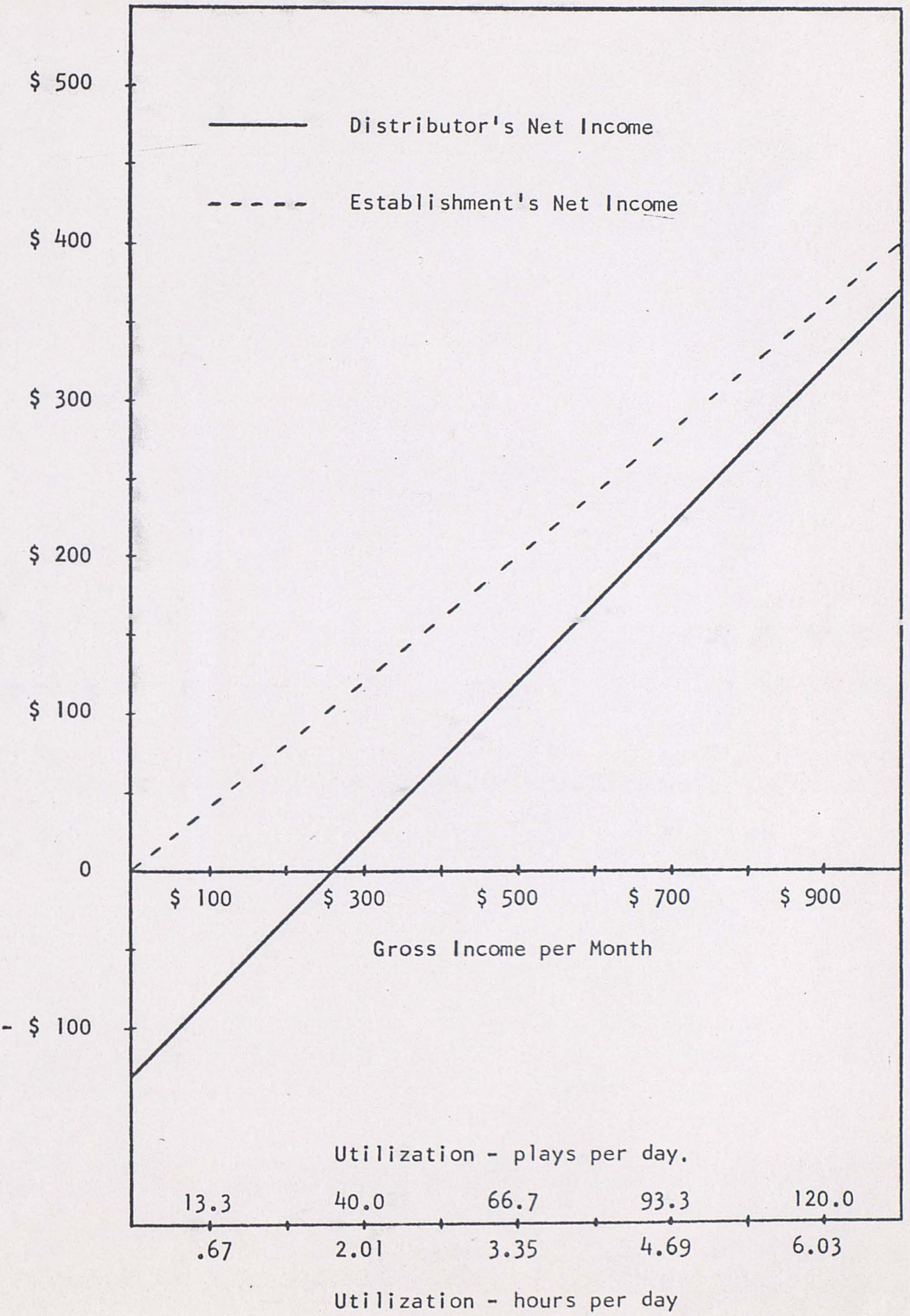
Monthly Revenue Projections

Monthly Gross Income	Utilization		Establishment's Monthly Net (40%)	Distributor's Monthly Expenses							Distributor's Monthly Net
	plays/day	hours/day		A	B	C	D	E	F	TOTAL	
$ 100	13.3	.67	$ 40	$ 15	$ 10	$ 15	$ 60	$ 30	$ 10	$ 140	$ (80)
200	26.7	1.34	80	15	10	15	60	30	20	150	(30)
300	40.0	2.01	120	15	10	15	60	30	30	160	20
400	53.3	2.68	160	15	10	15	60	30	40	170	70
500	66.7	3.35	200	15	10	15	60	30	50	180	120
600	80.0	4.02	240	15	10	15	60	30	60	190	170
700	93.2	4.69	280	15	10	15	60	30	70	200	220
800	106.7	5.36	320	15	10	15	60	30	80	210	270
900	120.0	6.03	360	15	10	15	60	30	90	220	320
1000	133.3	6.70	400	15	10	15	60	30	100	230	370

Expense Key:
A - Computer System Maintenance
B - Display Unit Maintenance
C - Telephone Line (approximate)
D - Display Unit Lease (if applicable)
E - Games (average)
F - Royalty (10% of gross)

"CHALLENGE"

Monthly Revenue Projections



APPENDIX III

DEMONSTRATION PROGRAM OUTPUT

(Underlined characters are players responces.)

```
****  ENTERTAINMENT SYSTEMS INTERNATIONAL  ****

   NO.       GAMES AVAILABLE          COST
 ----------------------------------------------

    1          ARTILLERY        .25 / 3 TARGETS
    2          DERBY            .25 / 2 BETS
    3          BANDIT           .25 / 10 PLAYS
    4          ARTILLERIA       .25 / 3 BLANCOS  (EN ESPANOL)

TO PLAY - PLEASE DEPOSIT 25 CENTS.

CONTINUE LAST GAME PLAYED ('YES' OR 'NO' & 'GO')? N

ENTER GAME NO. & HIT 'GO'? 1
```

```
* * *   A R T I L L E R Y   G A M E   * * *

DO YOU NEED THE INSTRUCTIONS ('YES' OR 'NO' & 'GO')? Y

YOU ARE AN ARTILLERY OFFICER WHO GIVES
FIRING ORDERS TO A GUN CREW, TELLING
THEM THE DEGREES OF ELEVATION WHICH
YOU THINK WILL PLACE THE PROJECTILE ON TARGET.
MAXIMUM RANGE OF THE GUN IS 5,000 YARDS.
A HIT WITHIN 100 YARDS OF THE TARGET WILL DESTROY IT.

A *FREE* TARGET IS AWARDED WHEN ANY TARGET IS DESTROYED WITH ONE SHO

A *FREE* GAME IS AWARDED IF YOUR SKILL FACTOR RATING EXCEEDS 50%.

ENTER THE DEGREES OF ELEVATION WHEN REQUESTED.


TARGETS REMAINING: 3
TARGETS DESTROYED: 0

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 4952 YARDS.

ELEVATION? 120
MAX. ELEVATION OF GUN IS 89 DEGREES.

ELEVATION? 89
SHORT OF TARGET BY 4777 YARDS.

ELEVATION? 60
SHORT OF TARGET BY 622 YARDS.

ELEVATION? 45

<<TARGET DESTROYED>> 3 ROUNDS EXPENDED.

TARGETS REMAINING: 2
TARGETS DESTROYED: 1

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 3876 YARDS.
```

```
ELEVATION? 25

<<TARGET DESTROYED>> 1 ROUNDS EXPENDED.

TARGETS REMAINING: 2
TARGETS DESTROYED: 2

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 3475 YARDS.

ELEVATION? 21
SHORT OF TARGET BY 130 YARDS.

ELEVATION? 22

<<TARGET DESTROYED>> 2 ROUNDS EXPENDED.

TARGETS REMAINING: 1
TARGETS DESTROYED: 3

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 3944 YARDS.

ELEVATION? 28
OVER TARGET BY 201 YARDS.

ELEVATION? 26

<<TARGET DESTROYED>> 2 ROUNDS EXPENDED.


CREW DISMISSED.


TOTAL TARGETS DESTROYED: 4

TOTAL ROUNDS EXPENDED: 8


SKILL FACTOR RATING = (TARGETS DESTROYED) / (ROUNDS EXPENDED) = 50 %
```

```
CONGRATULATIONS... YOU WON A FREE GAME.


* * *   A R T I L L E R Y   G A M E   * * *

DO YOU NEED THE INSTRUCTIONS ('YES' OR 'NO' & 'GO')? N

TARGETS REMAINING: 3
TARGETS DESTROYED: 0

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 2166 YARDS.

ELEVATION? 15
OVER TARGET BY 334 YARDS.

ELEVATION? 12
SHORT OF TARGET BY 132 YARDS.

ELEVATION? 13

<<TARGET DESTROYED>> 3 ROUNDS EXPENDED.

TARGETS REMAINING: 2
TARGETS DESTROYED: 1

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.

DISTANCE TO THE TARGET IS 4211 YARDS.

ELEVATION? 32
OVER TARGET BY 283 YARDS.

ELEVATION? 30
OVER TARGET BY 119 YARDS.

ELEVATION? 29

<<TARGET DESTROYED>> 3 ROUNDS EXPENDED.

TARGETS REMAINING: 1
TARGETS DESTROYED: 2

THE FORWARD OBSERVER HAS LOCATED A NEW TARGET.
```

```
DISTANCE TO THE TARGET IS 1837 YARDS.

ELEVATION? 10
SHORT OF TARGET BY 127 YARDS.

ELEVATION? 11

<<TARGET DESTROYED>> 2 ROUNDS EXPENDED.


CREW DISMISSED.

TOTAL TARGETS DESTROYED: 3

TOTAL ROUNDS EXPENDED: 8

SKILL FACTOR RATING = (TARGETS DESTROYED) / (ROUNDS EXPENDED) = 37 %




****  ENTERTAINMENT SYSTEMS INTERNATIONAL  ****


   NO.       GAMES AVAILABLE          COST
  ----------------------------------------------

    1          ARTILLERY        .25 / 3 TARGETS
    2          DERBY            .25 / 2 BETS
    3          BANDIT           .25 / 10 PLAYS
    4          ARTILLERIA       .25 / 3 BLANCOS   (EN ESPANOL)

TO PLAY - PLEASE DEPOSIT 25 CENTS.

CONTINUE LAST GAME PLAYED ('YES' OR 'NO' & 'GO')? N

ENTER GAME NO. & HIT 'GO'? 2
```

```
* * *   D E R B Y   G A M E   * * *

      SEVENTH - 1 MILE, 3 YR. OLDS        POST 2:35

   HORSE        NO.     ODDS
-----------   -----   ------
MAN O'WAR      (1)      3:1
CITATION       (2)      4:1          YOU HAVE $ 20 TO WAGER ON TWO BETS.
WHIRLAWAY      (3)      5:1
ASSAULT        (4)      8:1
SEABISCUIT     (5)      9:1          A *FREE* RACE IS AWARDED IF YOUR
GALLANT FOX    (6)     11:1          TOTAL WINNINGS EXCEEDS $50.
STYMIE         (7)     20:1
COALTOWN       (8)     30:1

BET NO.  1
HORSE NO. (1-8)? 9  TO WIN, PLACE, OR SHOW (1, 2, OR 3)? 4  WAGER? 30

HORSE NO. MUST BE BETWEEN 1 AND 8.  ENTER HORSE NO. ? 7

WIN-PLACE-SHOW MUST BE BETWEEN 1 AND 3.  ENTER WIN-PLACE-SHOW? 3

BET MUST BE BETWEEN $2 AND $ 18 .  ENTER WAGER? 12

BET NO.  2
HORSE NO. (1-8)? 8  TO WIN, PLACE, OR SHOW (1, 2, OR 3)? 3  WAGER? 10


BET MUST BE BETWEEN $2 AND $ 8 .  ENTER WAGER? 8


   THEY'RE OFF AND RUNNING -

 AS THEY BREAK FROM THE GATE -                    YOU HAVE -
POS.   HORSE      LENGTHS BEHIND                $ 12 ON NO. 7 TO SHOW
----   -----      --------------                $ 8  ON NO. 8 TO SHOW
 1  MAN O'WAR (1)
 2  ASSAULT (4)          1.5
 3  WHIRLAWAY (3)        2.4
 4  COALTOWN (8)         3.3
 5  GALLANT FOX (6)      3.8
 6  CITATION (2)         3.9
 7  SEABISCUIT (5)       4.8
 8  STYMIE (7)           5.2
```

AT THE 1/4 MILE POLE -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	ASSAULT (4)	.8
3	GALLANT FOX (6)	3.4
4	SEABISCUIT (5)	4.1
5	COALTOWN (8)	4.2
6	WHIRLAWAY (3)	4.2
7	CITATION (2)	6.2
8	STYMIE (7)	6.9

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

NEARING THE HALFWAY MARK -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	ASSAULT (4)	1
3	WHIRLAWAY (3)	2.5
4	CITATION (2)	4.8
5	GALLANT FOX (6)	4.9
6	COALTOWN (8)	5.4
7	SEABISCUIT (5)	7.6
8	STYMIE (7)	9.1

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

MIDWAY IN THE RACE -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	WHIRLAWAY (3)	.2
3	ASSAULT (4)	.6
4	SEABISCUIT (5)	3
5	CITATION (2)	5.2
6	GALLANT FOX (6)	5.3
7	STYMIE (7)	5.3
8	COALTOWN (8)	5.9

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

AT 5/8 OF A MILE -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	ASSAULT (4)	.2
3	WHIRLAWAY (3)	4.1
4	CITATION (2)	4.3
5	STYMIE (7)	4.8
6	GALLANT FOX (6)	6.3
7	SEABISCUIT (5)	7.2
8	COALTOWN (8)	7.5

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

ROUNDING THE TURN -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	WHIRLAWAY (3)	3.3
3	CITATION (2)	3.5
4	ASSAULT (4)	3.5
5	STYMIE (7)	5.4
6	GALLANT FOX (6)	7.7
7	SEABISCUIT (5)	9.2
8	COALTOWN (8)	10.1

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

COMMING DOWN THE STRETCH -

POS.	HORSE	LENGTHS BEHIND
1	MAN O'WAR (1)	
2	ASSAULT (4)	1.3
3	WHIRLAWAY (3)	1.9
4	STYMIE (7)	3.8
5	CITATION (2)	4.2
6	GALLANT FOX (6)	4.9
7	COALTOWN (8)	7.1
8	SEABISCUIT (5)	9.8

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

FINISH

POS.	HORSE	LENGTHS BEHIND
1	ASSAULT (4)	
2	WHIRLAWAY (3)	.8
3	MAN O'WAR (1)	2
4	GALLANT FOX (6)	3.9
5	STYMIE (7)	5.9
6	CITATION (2)	6
7	SEABISCUIT (5)	7.8
8	COALTOWN (8)	8

YOU HAVE -
$ 12 ON NO. 7 TO SHOW
$ 8 ON NO. 8 TO SHOW

$2 MUTUELS PAID:

WIN	PLACE	SHOW
18.38	7.06	4.39
	5.39	3.54
		2.64

WIN: 1 ASSAULT (4)
PLACE: 2 WHIRLAWAY (3)
SHOW: 3 MAN O'WAR (1)

BET NO. 1 ($ 12 TO SHOW)
TEAR UP YOUR TICKET ON STYMIE (7)

BET NO. 2 ($ 8 TO SHOW)
TEAR UP YOUR TICKET ON COALTOWN (8)

YOUR TOTAL LOSSES AMOUNT TO $ 20

```
****  ENTERTAINMENT SYSTEMS INTERNATIONAL  ****

   NO.       GAMES AVAILABLE          COST
  ------------------------------------------

    1          ARTILLERY        .25 / 3 TARGETS
    2          DERBY            .25 / 2 BETS
    3          BANDIT           .25 / 10 PLAYS
    4          ARTILLERIA       .25 / 3 BLANCOS  (EN ESPANOL)

TO PLAY - PLEASE DEPOSIT 25 CENTS.

CONTINUE LAST GAME PLAYED ('YES' OR 'NO' & 'GO')? N

ENTER GAME NO. & HIT 'GO'? 3


          * * *  B A N D I T  G A M E  * * *

DO YOU NEED THE INSTRUCTIONS ('YES' OR 'NO' & 'GO')? Y

THIS DEVICE WILL ACT LIKE A SLOT MACHINE.
YOU START WITH $ 20 TO WAGER ON 10 PLAYS. THE
MACHINE WILL ACCEPT ANY NUMBER OF SILVER DOLLARS
ON EACH PLAY, UP TO THE LIMIT OF YOUR CASH
BALANCE.  THE GAME WILL END IF YOU LOOSE ALL OF
YOUR MONEY, GOOD LUCK.

5 *FREE* PLAYS ARE AWARDED IF YOUR TOTAL
WINNINGS EXCEEDS $20.

10 *FREE* PLAYS ARE AWARDED IF YOUR TOTAL
WINNINGS EXCEEDS $50.


...HOW MANY SILVER DOLLARS ON THE FIRST PLAY? 2


PLUM       BELL       ORANGE                  (YOU HAVE 9 PLAYS LEFT)

...A LOSER.  BALANCE: $ 18   NEXT BET ? 2
```

```
PLUM        CHERRY        BELL                    (YOU HAVE 8 PLAYS LEFT)
...A LOSER.  BALANCE: $ 16   NEXT BET ? 2

PLUM        CHERRY        CHERRY                  (YOU HAVE 7 PLAYS LEFT)
...A LOSER.  BALANCE: $ 14   NEXT BET ? 15
...ILLEGAL BET, YOU ONLY HAVE $ 14
HOW MUCH DO YOU BET? 2

PLUM        ORANGE        BELL                    (YOU HAVE 6 PLAYS LEFT)
...A LOSER.  BALANCE: $ 12   NEXT BET ? 2

PLUM        CHERRY        -7-                     (YOU HAVE 5 PLAYS LEFT)
...A LOSER.  BALANCE: $ 10   NEXT BET ? 2

PLUM        BELL          PLUM                    (YOU HAVE 4 PLAYS LEFT)
...A LOSER.  BALANCE: $ 8    NEXT BET ? 2

MELON       BELL          ORANGE                  (YOU HAVE 3 PLAYS LEFT)
...A LOSER.  BALANCE: $ 6    NEXT BET ? 2

ORANGE      CHERRY        BELL                    (YOU HAVE 2 PLAYS LEFT)
...A LOSER.  BALANCE: $ 4    NEXT BET ? 4

CHERRY      CHERRY        BELL                    (YOU HAVE 1 PLAYS LEFT)
YOU WIN: $ 20  BALANCE: $ 20   NEXT BET ? 20
```

```
*BAR*        CHERRY        CHERRY

...A LOSER.

YOU HAVE JUST RUN OUT OF MONEY.
YOUR GAME IS OVER NOW.  SORRY ABOUT THAT.

YOU LOST $ 20

THANK YOU FOR THE GAME.  NOW GIVE THE SEAT TO ANOTHER
PLAYER WITH MONEY TO LOSE.



****  ENTERTAINMENT SYSTEMS INTERNATIONAL  ****

   NO.       GAMES AVAILABLE          COST
 ----------------------------------------------

    1          ARTILLERY        .25 / 3 TARGETS
    2          DERBY            .25 / 2 BETS
    3          BANDIT           .25 / 10 PLAYS
    4          ARTILLERIA       .25 / 3 BLANCOS   (EN ESPANOL)

TO PLAY - PLEASE DEPOSIT 25 CENTS.

CONTINUE LAST GAME PLAYED ('YES' OR 'NO' & 'GO')? N

ENTER GAME NO. & HIT 'GO'? 4
```

```
* * *   J U E G O   D E   A R T I L L E R I A   * * *

NECESITA INSTRUCCIONES ('SI' O 'NO' Y 'MANDE')? Y

USTED ES UN OFICIAL DE LA ARTILLERIA QUIEN DA
ORDENES DE DISPARAR A LOS GUERRILLEROS, DANDOLES LOS
GRADOS DE ELEVACION QUE USTED CREE PONDRA EL
PROYECTIL EN EL BLANCO.
EL ALCANCE MAXIMUN DEL CANON ES DE 5,000 METROS.
UN TIRO DENTRO DE 100 METROS DEL BLANCO, LO DESTRUIRA.
SI EL BLANCO ES DESTRUIDO CON UN SOLO PROYECTIL,
USTED GANA UN BLANCO DE VALDE.
ENTRE LA ELEVACION EN GRADOS CUANDO ES REQUERIDA.

BLANCOS QUE QUEDAN: 3
BLANCOS DESTRUIDOS: 0
DISTANCIA AL BLANCO ES 3060 METROS.

ELEVACION? 20
PASO EL BLANCO POR 153 METROS.

ELEVACION? 19

<<OBJETIVO DESTRUIDO>> 2 TIROS DISPARADOS.

EL GUIA HA DESCUBIERTO OTRO BLANCO.

BLANCOS QUE QUEDAN: 2
BLANCOS DESTRUIDOS: 1
```

```
DISTANCIA AL BLANCO ES 2574 METROS.

ELEVACION? 14
FALTO AL BLANCO POR 227 METROS.

ELEVACION? 16

<<OBJETIVO DESTRUIDO>> 2 TIROS DISPARADOS.

EL GUIA HA DESCUBIERTO OTRO BLANCO.

BLANCOS QUE QUEDAN: 1
BLANCOS DESTRUIDOS: 2

DISTANCIA AL BLANCO ES 4919 METROS.

ELEVACION? 45

<<OBJETIVO DESTRUIDO>> 1 TIROS DISPARADOS.

EL GUIA HA DESCUBIERTO OTRO BLANCO.

BLANCOS QUE QUEDAN: 1
BLANCOS DESTRUIDOS: 3

DISTANCIA AL BLANCO ES 2040 METROS.

ELEVACION? 10
FALTO AL BLANCO POR 330 METROS.

ELEVACION? 13
PASO EL BLANCO POR 151 METROS.

ELEVACION? 12

<<OBJETIVO DESTRUIDO>> 3 TIROS DISPARADOS.

CARAVINEROS DESBANDESEN.

TOTAL DE BLANCOS DESTRUIDOS: 4
```

APPENDIX IV

VIDEO DISPLAY SPECIFICATIONS

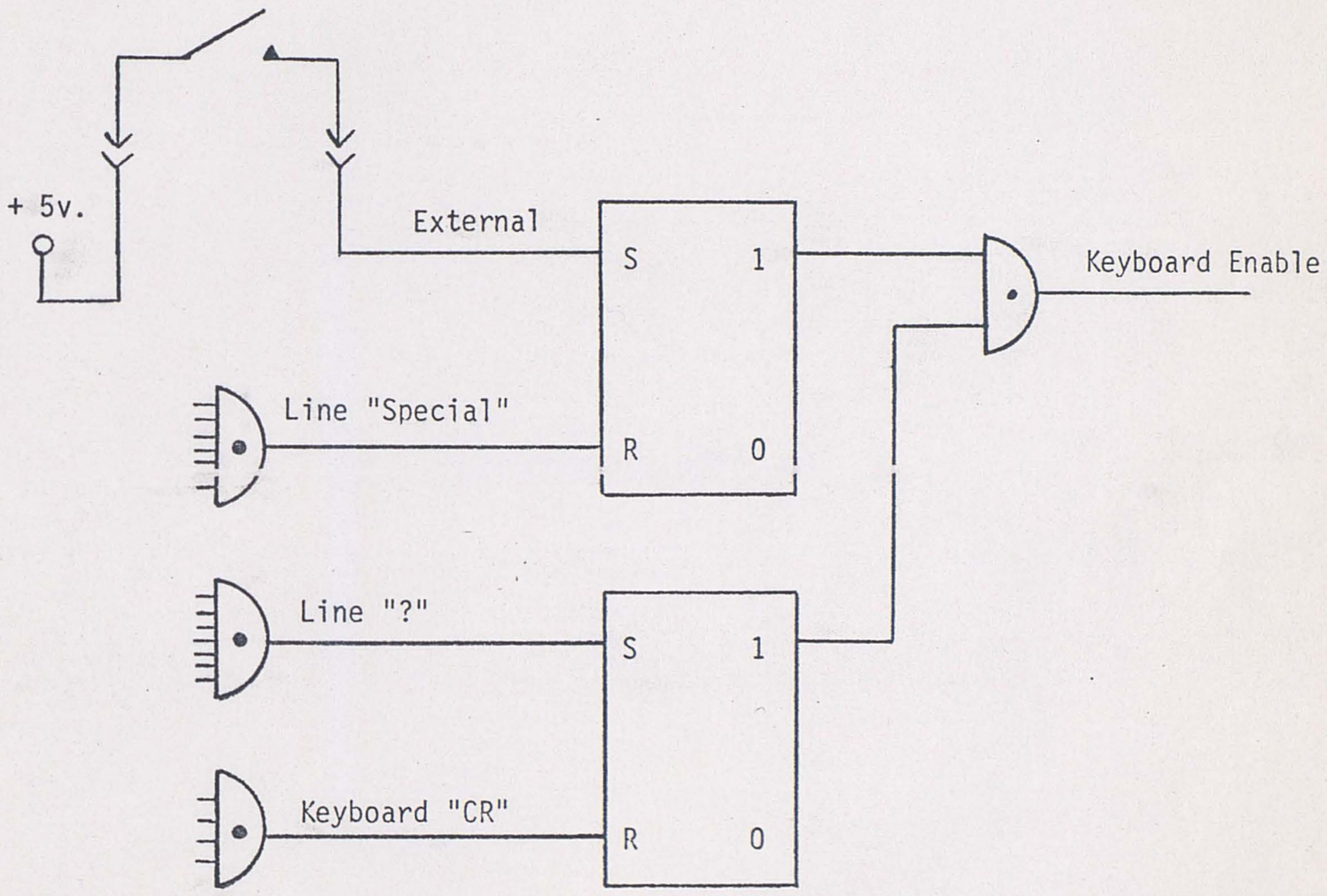
SPECIAL PURPOSE CRT TERMINAL SPECIFICATIONS

Screen Size:	7" x 9" (minimum)
Characters/Line:	80 (minimum)
Lines/Screen:	20 (minimum)
Character Set:	64 ASCII (upper case)
Character Size:	.08" x .19" (minimum)
Character Format:	5 x 7 dot matrix (minimum)
Cursor:	Blinking underscore (5 times/sec.)
Refresh Rate:	50 or 60 Hz
Color:	White - P4 Phosphor
Weight:	50 lbs. (maximum)
Humidity:	0 to 95% non-condensing
Temperature:	0 to 40 C (operating) -30 to 70 C (storage)
Power:	125 watts (maximum) 105-125 volts, 60 Hz 105-125 volts, 50 Hz (Export Model) 205-250 volts, 50 Hz (Export Model)
Readability:	Screen easily read without disruptive reflections in 100 foot candle illumination.
Interface:	300 baud EIA RS-232C
Keyboard:	13 Keys (see sketch)
Display Mode:	Roll

Special ASCII character commands:

1. Start Blinking (all characters following will blink 2 times/sec.)
2. Stop Blinking (termination of blinking characters)
3. Clear Screen
4. Cursor Home (upper left corner)
5. Cursor Up (one line)
6. Cursor Down (one line)
7. Cursor Left (one space)
8. Cursor Right (one space)
9. Line Feed/Carriage Return
10. TAB 15 spaces to the right
11. ASCII "Bell" Character shall "beep"
12. Keyboard disable on Keyboard ASCII "CR" command
13. Keyboard enable on received ASCII "?" character
14. "Keyboard Enable" armed on local external momentary ckt. closure.
15. "Keyboard Enable" disarmed on special received ASCII character.
16. Start Reverse Video
17. Start Reverse Video and Blinking
18. Stop Reverse Video

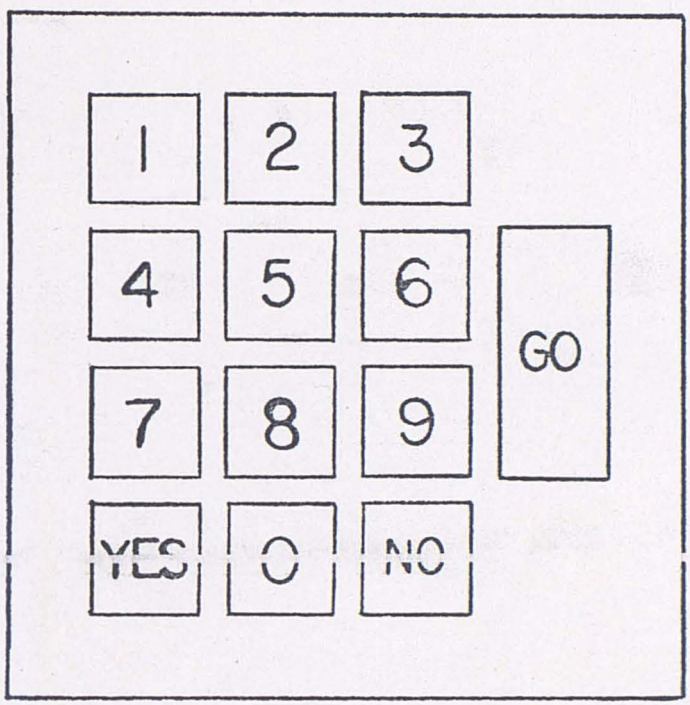
KEYBOARD CONTROL LOGIC



Keyboard Enable = "External" AND "?"

Keyboard Disable = "Special" OR "CR"

KEYBOARD LAYOUT



Notes: Scale = Full
GO Key generates ASCII "Carriage Return" character
YES Key generates ASCII "Y" character
NO Key generates ASCII "N" character
Numeric Keys generate the corresponding numeric ASCII characters
Numeric Keys are Black in color with White numerals
YES, NO, and GO Keys are White in color with Black letters

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3. Stanley M. Levin, "Market Survey: Coin-Operated Electronic Dart Board Games" (unpublished report of a market survey conducted throughout Florida, 1973).

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BIOGRAPHICAL SKETCH

Stanley M. Levin was born August 4, 1937, in Miami, Florida. He received the degree of Bachelor of Science in Electrical Engineering from the University of Miami in 1960. In his early years as a Design Engineer, working in the Aerospace Industry, he received extensive experience in logic design, real-time programming, scientific programming and hybrid programming. For the last four years Mr. Levin has been engaged in Computer Systems Sales and Applications Engineering where he was involved in configurating computer systems and peripherals, giving technical presentations and computer demonstrations, marketing and writing system proposals. In 1972, he enrolled in the Graduate School at Florida Technological Univeristy to finish his Masters degree program. He received the degree of Master of Science in Engineering in the Industrial Engineering and Management Systems Department in June, 1973.

Mr. Levin is married and has three children. He is presently employed as Computer Systems Marketing Manager for an engineering firm specializing in selling computer systems and peripherals to educational institutions.